

A Summary of the:



January 2006

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INTRODUCTION

Nationwide shortages in commodities such as cement, lumber and steel, along with labor shortages, have led to a recent spike in construction costs. These shortages are affecting all sectors of the economy, including housing, schools and commercial construction, as well as public works projects such as freeway and other major transportation projects.

To seek a better understanding about the factors causing these shortages and to look at ways to proactively address this issue, the Maricopa Association of Governments (MAG) hosted a *Challenge of Construction Forum* on Friday, January 6, 2006.

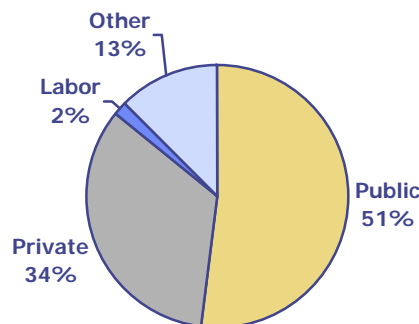
Speakers included representatives from MAG, the Associated General Contractors of America (AGC), the Arizona Department of Transportation, the Arizona School Facilities Board, the Home Builders Association of Central Arizona, and the Arizona Builders' Alliance.

The main objective for the forum was to present a comprehensive overview of the challenges facing the construction industry and to develop implementable action items at all levels, including local, regional, and state levels as well as within the industry itself. By having the broader community involved in these discussions, policymakers and industry leaders can develop potential policy changes to lessen the impacts of rising construction costs.

During the forum, speakers distributed several handouts. The chief economist of Associated General Contractors distributed a paper detailing the cost outlook for construction materials, as well as a newsletter called the Data DIGest. The Arizona division of AGC presented a white paper detailing an industry survey of members about rising material costs. The National Association of Home Builders distributed a report dealing with shortages of building materials after Hurricane Katrina. These reports are available under separate cover, and key findings are included in this report.

About 230 people attended the forum. A general breakdown of the demographics is seen in the pie chart below.

General Demographic Breakdown of Participants



PROBLEM STATEMENT

National Outlook

According to the Associated General Contractors of America (AGC), construction materials costs were highly volatile in 2004-2005, and rose much more than in previous years. Hurricanes Katrina and Rita accentuated the difference between construction materials and other costs, adding to scarcity for some building supplies. Petroleum and natural gas impacts, in particular diesel fuel costs, affect contractors three ways: 1) offroad equipment, 2) onroad equipment, and 3) production of plastics that use natural gas or crude oil as a feedstock. According to the Energy Information Administration, on-highway diesel fuel costs are up 25 percent from a year before. The price of diesel in the next few months will be influenced by the demand for heating oil.

Natural gas prices have doubled from a year ago, affecting the cost of a variety of construction plastics. In particular, polyvinyl chloride (PVC) pipe prices jumped 20 percent to 100 percent in the past three months, due in part to hurricane Rita and to an explosion at a resin plant. While the plants are now operating, many platforms remain out of commission indefinitely, constricting the supply of natural gas, which is used to heat 60 percent of homes. This uncertainty means that PVC and other hydrocarbon-based products, such as insulation and roofing materials, will remain 20 to 50 percent more expensive than at the same time in 2005. Natural gas is also used for heating and drying products such as brick and glass, which could also experience cost increases of 5 to 10 percent. The price of steel, gypsum and wood products appears to have spiked in 2004, with gypsum rising in 2005 while steel and wood prices seem to have eased.¹

Another significant issue is the price of cement and concrete, which rose 10 to 12 percent from November 2004 to November 2005, and major cement producers have announced further increases for the beginning of 2006. U.S. cement production rose 2 percent in 2004, but consumption increased 7 percent, making the U.S. increasingly dependent on imports. China is the world's top producer and second highest importer (after Canada). The Department of Commerce announced January 19, 2006 that the duty on Mexican cement imports were being dramatically lowered, from \$26 per metric ton to \$3 per metric ton, an 89 percent decrease, with imports capped at 3.0 million metric tons per year (there were 2.2 million tons imported in 2005). More importantly, the department announced that all limits and the duty would be removed in three years if both sides abide by the agreement.

According to AGC Chief Economist Ken Simonson, housing prices are up 34 percent, but due to growth it is anticipated that there will continue to be a high demand for materials. According to Arizona State University research, Arizona's population grew 3.6 percent last year, growing by about 200,000 people from July 2004 to July 2005.

Regional Outlook

Arizona, along with the rest of the nation, is experiencing serious shortages in a variety of commodities. Construction costs on highway projects have increased 20 to 50 percent over

¹ Simonson, Ken, Associated General Contractors of America, *The Post-"Kat/Rita" Cost Outlook for Construction Materials*, Arlington, VA, January 2006.

the past year. In a poll of its members, the Arizona Chapter of Associated General Contractors (AGC) found that contractors were experiencing shortages in cement, labor, PVC piping, asphalt, transportation, aggregate, steel, lumber, on-road diesel and off-road diesel and natural gas. These shortages led to an increase in pricing. According to the AGC poll, the top commodities that increased in price significantly over the last two years (in descending order) were cement, asphalt, off-road diesel, on-road diesel, PVC piping, aggregate, transportation, labor, steel, lumber and natural gas.

A major issue in Arizona centers around the production of cement. According to the Arizona Rock Products Association, Arizona produces 2.5 million tons of concrete each year. The demand is 4.6 million tons, and could go up to more than 5 million tons, so the remainder must be imported. The cost of cement went from \$100 per ton in August 2005 to \$117 per ton in October 2005. A current bid received by ADOT was \$180 per ton.

Aggregate for concrete has also seen a 30 percent increase in the past year due to processing and hauling costs and reduced availability of sources. Although the cost of steel may be leveling off, it has increased from \$0.55 per pound in 2003 to \$1.03 per pound in 2005. Diesel fuel prices have increased by 70 percent. Asphalt paving oil has increased 5.2 percent, and is expected to increase more in the near future.²

IMPACTS

Impacts on Transportation

The impact of rising material costs is being seen in a number of recent transportation projects, with bids 20 to 50 percent higher than estimates. Following are just a few recent examples of the cost impacts to transportation projects.

- U.S. 60 widening project from Gilbert Road to Power was estimated to cost \$59.7 million. Only two bids were received, with the lowest at \$73.7 million—23 percent higher than the state's estimate.
- Another project, the Red Mountain Freeway from University to Southern, received only one bid, for \$68.4 million, which was 38 percent higher than the state's estimate of \$52.4 million.
- Red Mountain Freeway between Power and University. The estimate was \$144 million, which is now \$213 million based on the low bid (48 percent higher).
- Loop 101 merge lane from Skunk Creek bridge to Union Hills Drive. The cost was estimated at \$1.7 million. The bid was awarded at \$2.05 million.
- I-17/Cactus Road interchange improvement. Estimated at \$3.6 million, the bid was awarded at \$5.9 million.

² Martin, David M., Arizona Chapter of Associated General Contractors of America, *Preliminary Draft White Paper on Construction Commodities in Arizona*, Phoenix, AZ, December 2005.

The Regional Transportation Plan includes safeguards to keep it accountable and in financial balance. A “Life Cycle” program is in place so that every year costs and revenues are “trued up” and revenues and expenditures remain in balance. The Transportation Policy Committee and MAG Regional Council had the foresight to include contingency funding in the Plan for cost increases. About 5 to 10 percent of the total Plan budget has been set aside for unanticipated external forces such as these.

In the “good news category,” there was a 17.6 percent increase in sales tax revenues for the first four months of the fiscal year (July to October) over the same period last year. This is about 8 percent higher than what was projected in the Regional Transportation Plan. However, it is becoming more apparent that increased costs are outpacing increased revenues.

Impacts on School Construction

The Arizona School Facilities Board reports that there are a number of unique challenges facing Arizona school construction. A major issue centers on appropriately identifying inflation. Construction budgets are approved once a year through the Joint Legislative Budget Committee (JLBC). According to the Board, the JLBC uses a national index that tracks all government construction, which runs considerably below local indexes. Another issue is adopting a budget that precedes actual construction by nearly a year, so the adopted inflation increase is not an accurate reflection of current costs. With highly volatile markets, accurately forecasting what construction costs will be 12 months from now becomes especially problematic. Currently the budget allows for only \$116 per square foot in K-6 school construction. Another issue identified by the Board was the use of various procurement methods that may cost more than other methods.

Impacts on Home Building

According to the National Association of Home Builders, the home building industry is also experiencing materials shortages. While the record levels of residential construction—and the gradual recovery of nonresidential construction—have created demands affecting all building materials, a number of different supply factors affect particular materials. The supply factors include plant capacity, raw materials supply, transportation and import tariffs. Some materials are produced domestically, but others are subject to global market conditions.

The Bureau of Labor Statistics calculates indexes measuring the wholesale price of materials used in various types of construction (weighted averages). For the 12 months ending August 2005, the index for new single-family residential construction rose by 4.2 percent, while the index for new multifamily construction rose by 6.2 percent. According to Global Insight, Inc., inflation in prices is predicted for asphalt paving, cement, construction machinery and equipment, lumber, and rock products such as sand, gravel, and crushed stone. Deflation is predicted for concrete reinforcing bars, fabricated pipe and fittings, fabricated structural metal and sheet metal, and plywood.³

³ Carliner, Michael, National Association of Home Builders, *Building Materials After Katrina*, October 2005.

According to the construction industry trade magazine *Engineering News-Record* (ENR), forecasting inflation for next year is difficult, as many economists predict the housing market may fall from its record levels. ENR predicts that year-to-year inflation measured by its Building Cost Index will subside to 1.5 percent by December 2006, compared to a 5.0 percent increase from 2004 to 2005, and 9.7 percent from 2003 to 2004. ENR's Construction Cost Index, which is weighted toward labor costs, is predicted to increase 2.8 percent next year, after increasing 4.6 percent during 2005 and 7.8 percent the previous year. If these forecasts hold, it would bring inflation levels back into the range held from 1993 to 2003.⁴

Impacts on Commercial Construction

According to the Arizona Builders' Alliance, the construction industry is nearing capacity, with a market of \$1.15 trillion. Twenty percent of all new construction in the world is taking place in the United States. Higher material prices are an indicator of short supply, and the shortages are starting to impact project schedules. According to the Alliance, smaller projects seem to be suffering more than larger projects in the commercial industry. In the past, project prices were kept down through schedule compression, but with delays causing project schedules to expand, prices are rising. These challenges are being seen in many other areas besides Arizona. In Albuquerque, ready-mix concrete is \$125 a cubic yard, versus \$85 to \$95 in the Valley. In France, the cost of rebar is 50 percent higher than in the U.S.⁵

Labor Issues

A shortage of available skilled and unskilled labor is also a concern, and according to the Arizona Department of Economic Security, the Arizona market experiences a 40 percent turnover of workers every year. The Arizona Builders' Alliance finds a shortage of trade workers of about 200,000 each year. Forum participants identified the lack of training, education and recruitment programs as a major issue facing the industry. The Arizona Builders' Alliance reported that the lack is a result of the fact that training is expensive and the reward long term, and with the high turnover, many companies find that often trained and skilled workers are then hired away by other companies. Arizona has 205,000 construction workers, with only 3,000 in apprenticeship programs. Arizona universities produce only 150 construction managers each year to oversee 135,000 workers. Nationwide, universities produce 4,000 construction management graduates each year, but the national need is 10,000.

Cement Shortage

The United States is a net importer of cement. With U.S. cement capacity limited, about a quarter of the cement used in the U.S. is imported. There have been widespread shortages of cement and concrete products since 2004. According to the Department of Commerce, last year, 32 states experienced cement shortages. According to the National Association of Home Builders, the lack of cement-making capacity in the U.S. is not because of a shortage of limestone or other raw materials. Rather, it cites regulatory barriers (mostly at the state and local levels) for blocking construction of new facilities and increasing the cost of making cement in the U.S. Additionally, the process of producing cement is energy-intensive, with

⁴ Grogan, Tim, *Getting Back To 'Normal'*, Engineering News-Record (ENR) December 2005.

⁵ Simonson, Ken, Associated General Contractors of America, *The Data DIGest*, Vol. 6, No.1 Arlington, VA, January 2006.

fuel costs accounting for about 20 percent of the producers' price.⁶ One forum attendee from Arizona said obtaining mining leases is a lengthy process, with the current record at 18 years. It was stated that the cement plant in Marana, Arizona has been trying to expand for 10 years.

According to industry experts, transportation and freight issues in delivering cement are additional challenges, with ship, port and rail capacity limited. There is a shortage of shipping containers, and 99 percent of rail cars are being utilized.

Summary of Impacts

Experts represented at the forum agreed that there is a high level of supply uncertainty and continued pressure on commodity supplies. High demand for contractors and laborers continue, and these pressures are affecting all segments of construction. The experts further agreed that it is uncertain whether materials costs have reached a new plateau, whether they will continue to rise, or whether they will decrease in the future. The greater uncertainty means bids are being increased to cover risk, and in many cases fewer bids are being offered due to the high risk. Material shortages are leading to higher prices, more schedule uncertainty, and reduced productivity. With no control over delays caused by shortages, contractors at the forum expressed a need to change contracts to revisit time delays and stay liquidated damages – they want to be held harmless for delays caused by material shortages.

SOLUTIONS

An important aspect of the *Challenge of Construction Forum* was a two-hour time block dedicated to a moderated group discussion. Before discussion began, participants were asked to write down three top solutions they would like to see addressed.

Among the top solutions mentioned, in descending order, were:

- Reducing restrictions on imports, primarily eliminating or reducing the duty on Mexican produced cement. (38 comments)
- Better training and education programs. (29)
- Working with industry and elected officials on shared solutions. (22)
- Developing shared risk/liability between owners and contractors within the contract framework. (16)
- Reviewing and evaluating standard specifications. (16)
- Innovative and streamlined procurement, contracting and partnering. (13)
- Initiating “cost-plus” pricing to allow flexibility in contracts. (13)
- Involving contractors earlier in the process, specifically by using them during the design/build phase and implementing “Contractor at Risk” programs in which the contractor is given a fee to manage and direct work. (12)
- Addressing labor shortages. (12)
- Addressing transportation (freight and delivery) issues. (8)

⁶ Carliner, Michael, National Association of Home Builders, *Building Materials After Katrina*, October 2005.

- Allowing flexibility in schedules. (7)

Following is the complete summary list of possible solutions as entered on comment cards by forum participants. The comments that follow are not listed in any particular order, but numbers in parenthesis indicate the number of times the comment was repeated.

Summary List of Solutions Identified by Forum Participants:

- Reduce/eliminate the duty on Mexican produced cement or other materials. (38)
 - Reduce restrictions on imports and vehicles for transit.
 - Lobby congressional delegates/Governor. (2)
 - Free up trade restrictions with foreign countries.
 - Increase imports from Mexico. Open more trade for labor and materials. (2)
 - Build a deep-water port in Mexico.
 - Arizona's proximity to Mexico will afford greater benefit and relief than any other areas of the U.S.
 - Improve trade relations with Mexico.
- Increase Arizona cement production and other materials. (8)
 - Need asphalt/petroleum refinery in Arizona.
 - More cement plants in Arizona. (2)
 - Increase capacity.
 - Expand cement plants.
 - Work with Arizona cement producers to increase capacity. Increase the amount of cement produced in Arizona before lifting the Mexican cement tariff. Protect Arizona industries.
 - Permitting and regulatory assistance for future expansion of cement, concrete and aggregate facilities to accommodate increased construction demand.
 - How would removing price incentives for cement production by introducing artificially low foreign products, which sell for under the domestic price, be a long-term solution?
- Modifications to construction contracts:
 - Develop shared risk/liability between owners/contractors within the contract framework for pricing. (16)
 - Establish statewide standards on construction risk for contractors, designers and owners.
 - Conduct cost and risk sharing analysis pre-award and post-award.
 - Allow contractors to make "conditional" bids.
 - Add cost indexes to concrete, steel to ADOT – special provisions to reduce risk and adjust unit prices accordingly. Index specific commodities to allow for cost increase or decreases during the construction period. (6)
 - Review the statutory formula inflation index more than one time a year (specifically for school construction).
 - One set of plans for schools – no design build.
 - Initiate "cost-plus pricing." (13)
 - Establish price adjustments specifications for ALL materials. Contractor/owner share savings and increases. (2)

- Indexed commodity pricing. Less expensive than how contractors are “hedging” now. (2)
 - Allow for commodity hedge contracts to control project costs. (2)
 - Improve the estimation process. (2)
 - Require third-party checks on estimates/budgets to verify project costs.
 - Create ability to pass increases in costs to owner.
 - Need escalator/de-escalator clauses. (3)
- Language changes in contracts.
 - Create common (MAG/ADOT) indemnification specifications like MAG construction specifications.
- Change language regarding shortages from national to regional.
- Warranty projects – reward innovations and cost savings. Provide contractor incentives for time and cost as well as penalties.
- Don’t penalize contractors for delays caused by material shortages.
- Prequalified contractor bidders and partnering. Expedite approval process. (2)
- Construction quality/performance bonuses.
- Allow for “unforeseen” conditions.
- Price adjustments in contracts.
- City council budget flexible amounts.
- More design/build.
- Reduce risk. (2)
- Hold parties responsible for programs/services they originally represented.
- If contractors want to treat prices as “hidden conditions,” require subcontractors/suppliers to submit their full breakdown of labor and material costs and quantities with their proposals to allow owners to honestly gauge the increase in material costs.
- Level the work schedule. (7)
 - Allow for greater flexibility in schedule.
 - Accelerate design/plan/review phase.
 - Remove artificial barriers to supply and schedules.
 - Cost and schedule adjustment contract provisions. Create more flexibility in construction schedules.
 - Have a materials plan – how to coordinate schedules/delivery so delays aren’t mandatory/unexpected. (2)
 - Do not force unrealistic time schedules.
 - Address “hand-offs” between construction disciplines or contractors up front to reduce overlaps and enhance schedule. Owners should drive this.
- Review of specification requirements. (16)
 - Institute evaluation and revisions to standard specifications. General provisions, etc. Then promote the sharing of information (open book) regarding commodity pricing for establishing indexes and or escrow document type process.
 - Employ (and be allowed to use) state-of-the-art materials and systems regarding changing specification and contracts.

- Develop/encourage alternative materials and design standards and alternative construction methods. (4)
- Challenge the “way we’ve always built it.”
- Develop standard minimums and range of add-ons.
- Modify specifications to reduce risk to contractors.
- Discuss potential for decreasing cement demand in concrete mixes. Often increased cement contents are required due to a) overdesign because of lawsuits due to mold or water migration; b) national specs as opposed to regional specs; c) specs with strength requirements but list unrealistic water/cement ratios.
- Be more aggressive and creative when considering alternative materials.
- Promote more fly ash for concrete specifications, short-term and longterm. Market drives production.
- Address transportation issues: (8)
 - Review federal Commercial Drivers License (CDL) restrictions.
 - Never lose sight of the need for better transportation.
 - Look at increasing bulk transportation capacity to Valley.
 - Address material transport shortages.
 - Address transportation needs prior to approving housing developments.
 - Reinvalidate rail to provide material and lessen demand for commuter traffic. (3)
 - Rail expansion.
 - Encourage improvements to railroad track capacity in Arizona.
 - Improve rail and truck distribution of construction commodities through collaboration with transportation industry organizations.
 - Encourage railroads and ports to increase capacity.
- Work with industry and elected officials on shared solutions. (22)
 - Industry focus groups to innovate.
 - Develop a coordinated “Working Group” with all major stakeholders to develop an action plan.
 - Workshops with owners/multiple contractors to conduct brainstorming on contracts.
 - Poll owners’ concerns.
 - Develop “regional” forums by commodity type with supply side/contractor/owner represented to discuss, share and evaluate industry capacity issues over the short and long term to assist in global type regional project delivery plans.
 - Broader range of coordination among industries, agencies to mitigate major spikes in demand.
 - Get contracting engineers to meet to consider proposed solutions.
 - Develop short and long term financial strategy to fund increased costs.
 - Identify and quantify if the current problem is short-term spike or new plateau to consider in establishing financial and delivery solutions.
 - Create a common updated database of commodity costs for everyone’s use. Maintain databases on costs and projects at regional/state/national levels. Need real-time estimating source. (3)
 - Group insurance coverage.

- Get intergovernmental agencies to work more closely for a speedier result.
- Joint industry-owner-legislative plan to address public projects; contract language must be win-win for all parties.
- Create owner awareness. Partner with owners to solve issues.
- Reduce government red tape.
- Demand leadership in resolving issues and pressing ahead.
- Continue to communicate to public about how serious the problems are.
- Public/private partnerships.
- Reduce wasteful activities/share resources. Do what you can with what you have. (2)
- Better coordination on multijurisdictional projects – to combine resources and fundamental ideas for a good, well-formed end result. (3)
- Offer incentives for construction contractors to relocate to Arizona (demand is high, supply is low). This would increase competition.
- Speed project delivery.
- Regulation/permitting: (6)
 - Reduce design/permitting time by doing project elements concurrently; design, environmental permitting, right-of-way acquisition can occur concurrently.
 - Get government out of the way in permitting and regulatory activities that are limiting the ability of domestic industries to grow capacity to meet demand.
 - Eliminate cross-jurisdictional regulatory restrictions; create more “one-stop-shop” opportunities for building permits, etc. Reduce regulatory restraints. (2)
 - Evaluate environmental permitting regulations. (2)
 - Regulatory changes on construction operations as well as on materials extraction and import.
 - Department of Environmental Quality/State Land advocacy of streamlining to shorten time lines for permitting and increase stability for quality mineral access. Remove mentality of institutional apathy.
- Involve contractors early on (earlier selection, participate in design/build, Construction Manager at Risk (CMAR), etc.) (7)
 - Alternative procurement methods – Construction Manager at Risk (CMAR)/Design Build (instead of traditional bid/build), and legislation to allow agencies to select best/lowest contractor, utilize more. CMAR is selected based on its qualifications – the owner and CMAR agree to the fee and cost to manage and direct work. CMAR guarantees work, cost and completion date. (12)
 - Design build/contract manager more universally used.
 - Use of alternative bid methods, allowing more freedom for setting prices. Look at further opening up of these bid methods in order for owners to be more creative. (2)

EVALUATION

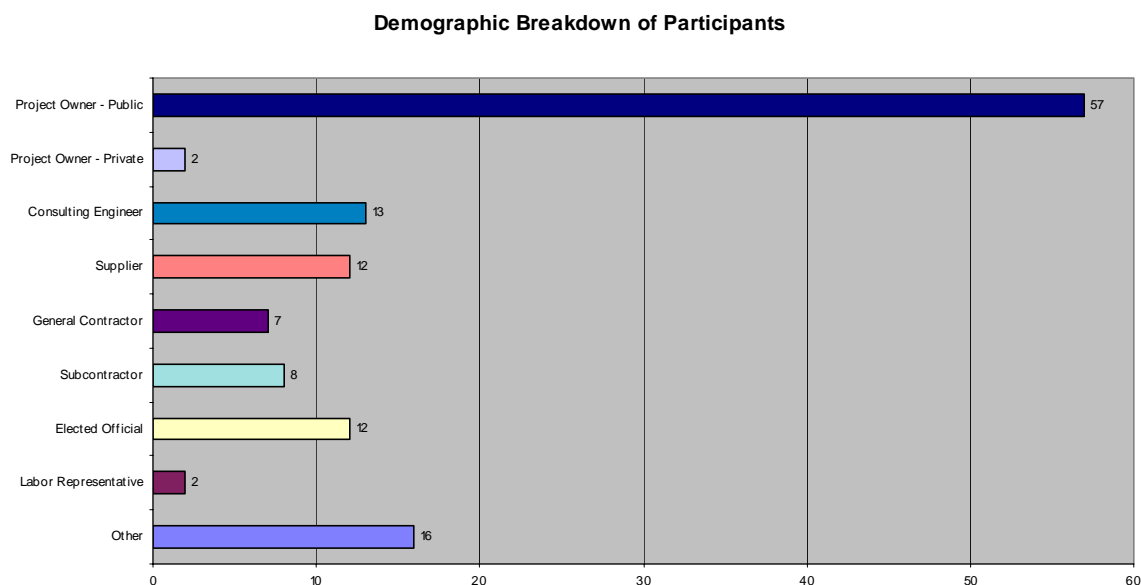
After participants identified their top three solutions on comment cards as indicated above, a moderated group discussion was held. As solutions were presented, they were entered into a computer file for later evaluation. The last 30 minutes of the discussion were devoted to rating the discussed solutions on how effective each would be in addressing the rising cost of construction in Arizona, using an electronic voting system.

During the evaluation period, participants were given a wireless keypad with which they were asked to rate each solution by entering a corresponding ranking. Because there were a limited number of keypads (127), participants were asked to join up with someone from a like industry and to vote as a team. They were also given the choice of filling out a paper ballot instead that could be entered into the report at a later time. Two paper ballots were received and added into the attached voting results.

Participants were first asked to identify their demographic information based on the following categories:

1. Project Owner – Public
2. Project Owner – Private
3. Consulting Engineer
4. Supplier
5. General Contractor
6. Subcontractor
7. Elected Official (State, City, Town, County)
8. Labor Representative
9. Other

A specific breakdown of the demographic participation is seen in the bar chart below:



Each solution was rated on a Likert scale of effectiveness from one through five, asking the question: “How effective do you feel the following proposed solution would be in

addressing the rising price of construction in Arizona?” followed by a letter of the alphabet, the proposed solution, then the effectiveness scale. The scale included: 1) Very Ineffective; 2) Somewhat Effective; 3) Neither Ineffective nor Effective; 4) Somewhat Effective; 5) Very Effective.

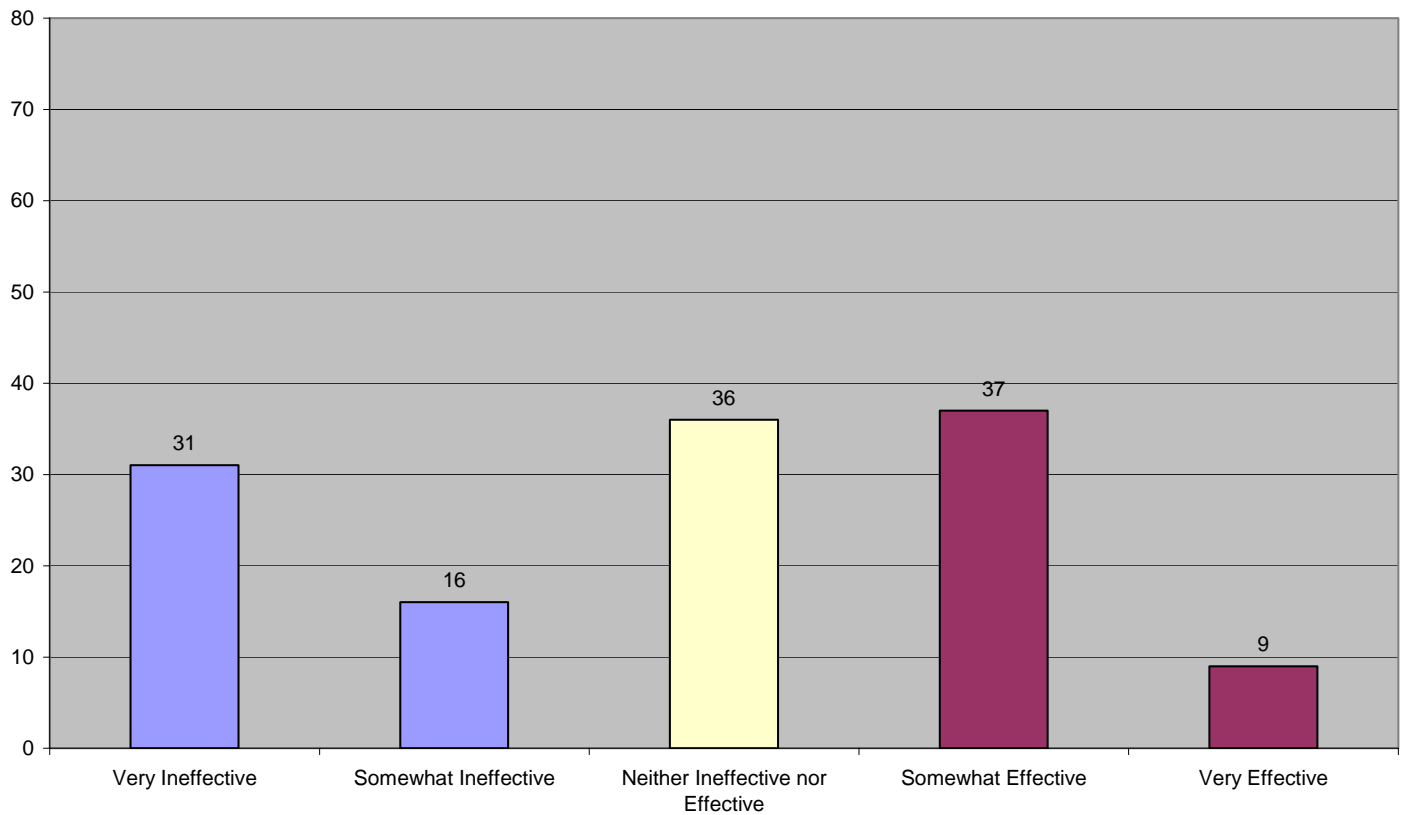
In the following summary, a chart showing how each solution was rated appears first, followed by a breakdown of the voting by demographic categories. Note that because only two individuals fell into the “Project Owner – Private” category, it was combined with the “Project Owner – Public” category into a single category called “Project Owner.” Because only two labor individuals were present, the “Labor” category was combined into “Other,” for a total of seven demographic categories.

Also, to make the demographic charts less cumbersome, rating categories were combined from five categories into three. “Very Ineffective and Somewhat Ineffective” were combined into “Ineffective,” “Neither Ineffective nor Effective” remained the same, and “Somewhat Effective and Very Effective” were combined into the single category, “Effective.”

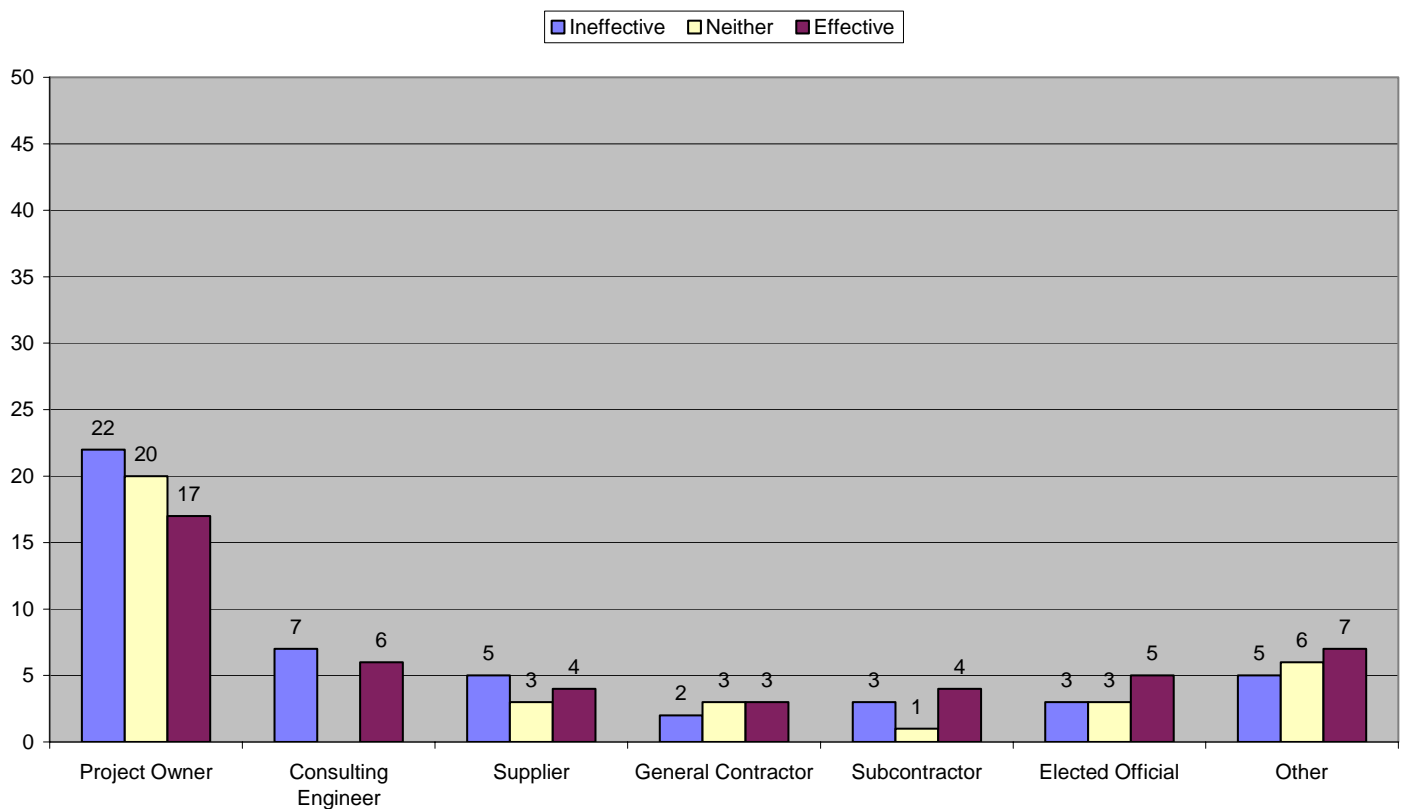
Following is a list of proposed solutions as voted on by the forum participants.

- Solution A: Price Hedging
- Solution B: Use Contractor in Design Process
- Solution C: Prepurchase Land and Materials
- Solution D: Reduce Construction Process Time by Concurrently Completing Tasks
- Solution E: Owners Share in Supply Price Risk
- Solution F: Flexibility in Construction Contracts
- Solution G: Package Multiple Projects Together
- Solution H: Index Materials
- Solution I: Extend Alternative Bid Procurement to Subcontractors
- Solution J: Reduce Tariffs on Mexican Imported Materials
- Solution K: Modify Bid and Appeal Process to Improve Productivity
- Solution L: Bring Key Stakeholders Together to Discuss Industry Issues
- Solution M: Reduce Federal Review Process on Federally Funded Projects
- Solution N: Update Local and State Contract Provisions
- Solution O: Make Environmental Laws/Controls More User Friendly
- Solution P: Increase Freight Rail Capacity
- Solution Q: Develop Uniform Regional Contract Requirements
- Solution R: Develop Variable Cost/Fee Scales to Adjust to Market Conditions

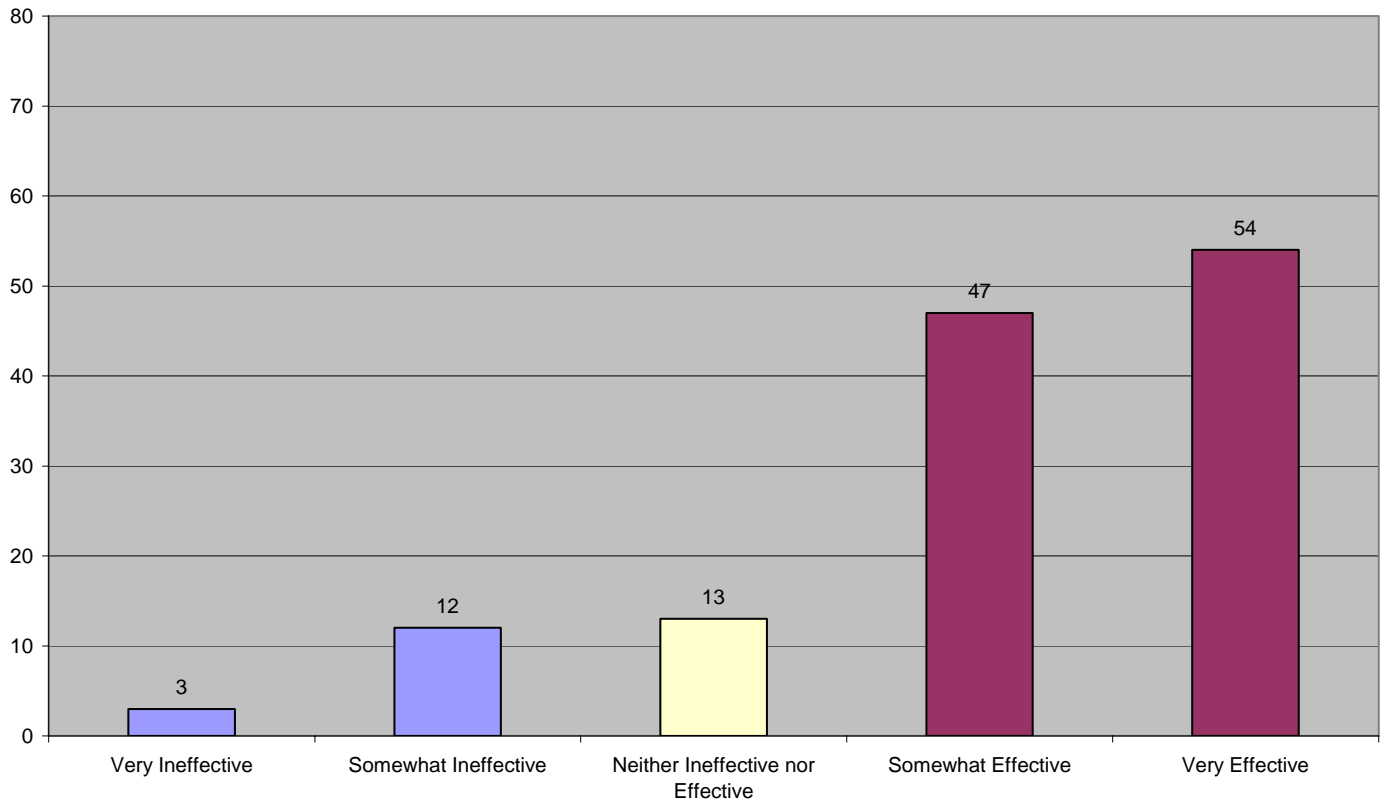
Solution A: Price Hedging Total Votes



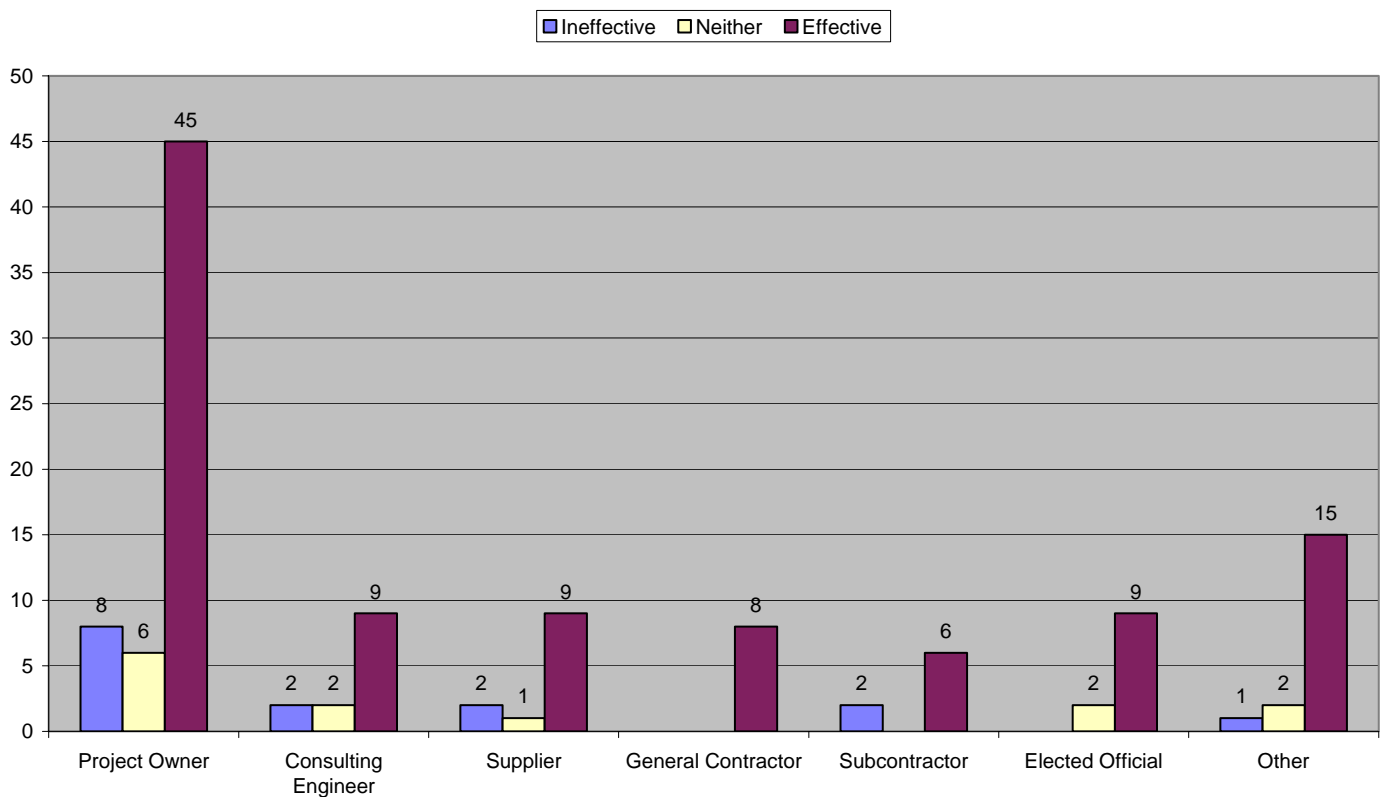
Solution A: Price Hedging Voting by Demographic Breakdown



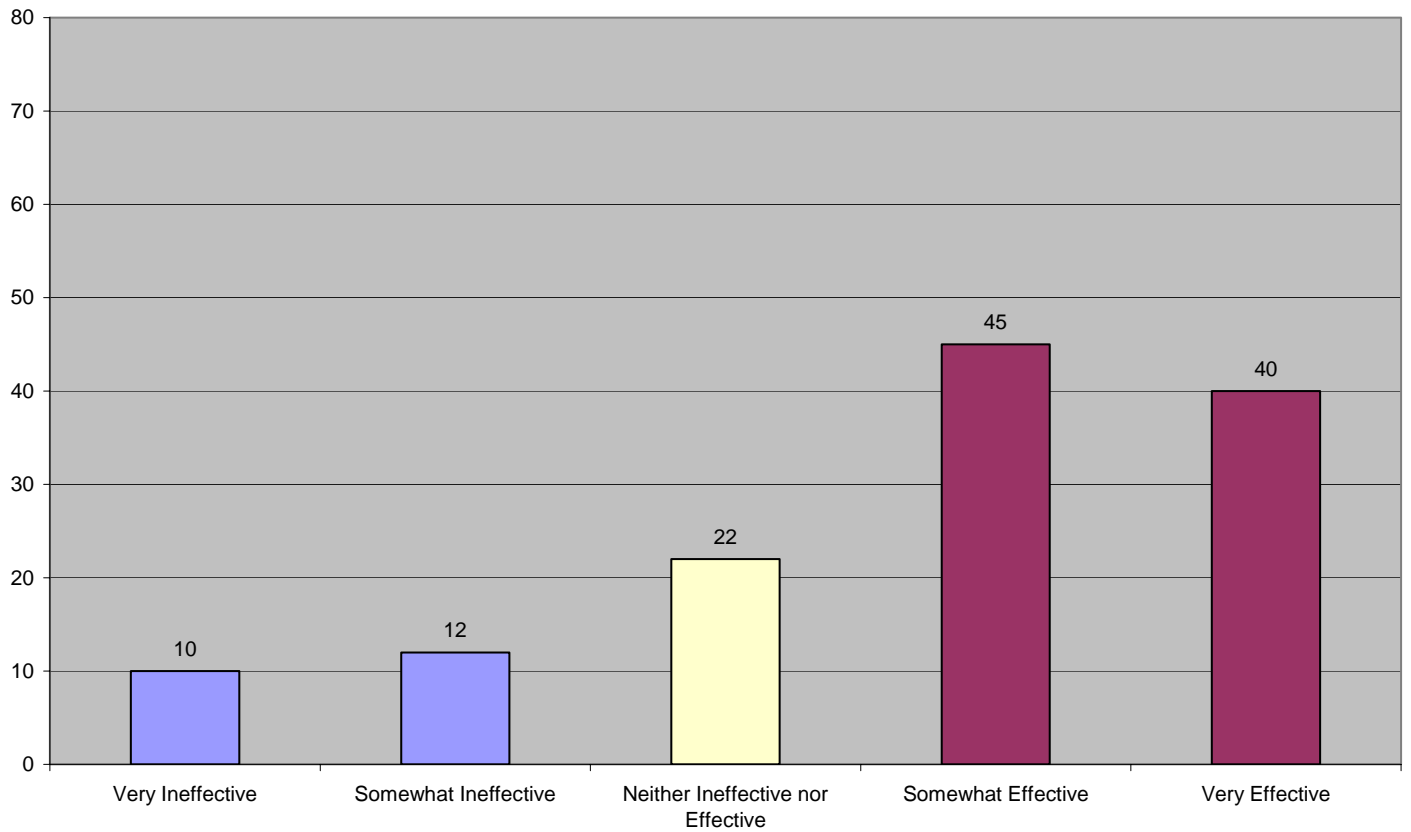
Solution B: Use Contractor in Design Process
Total Votes



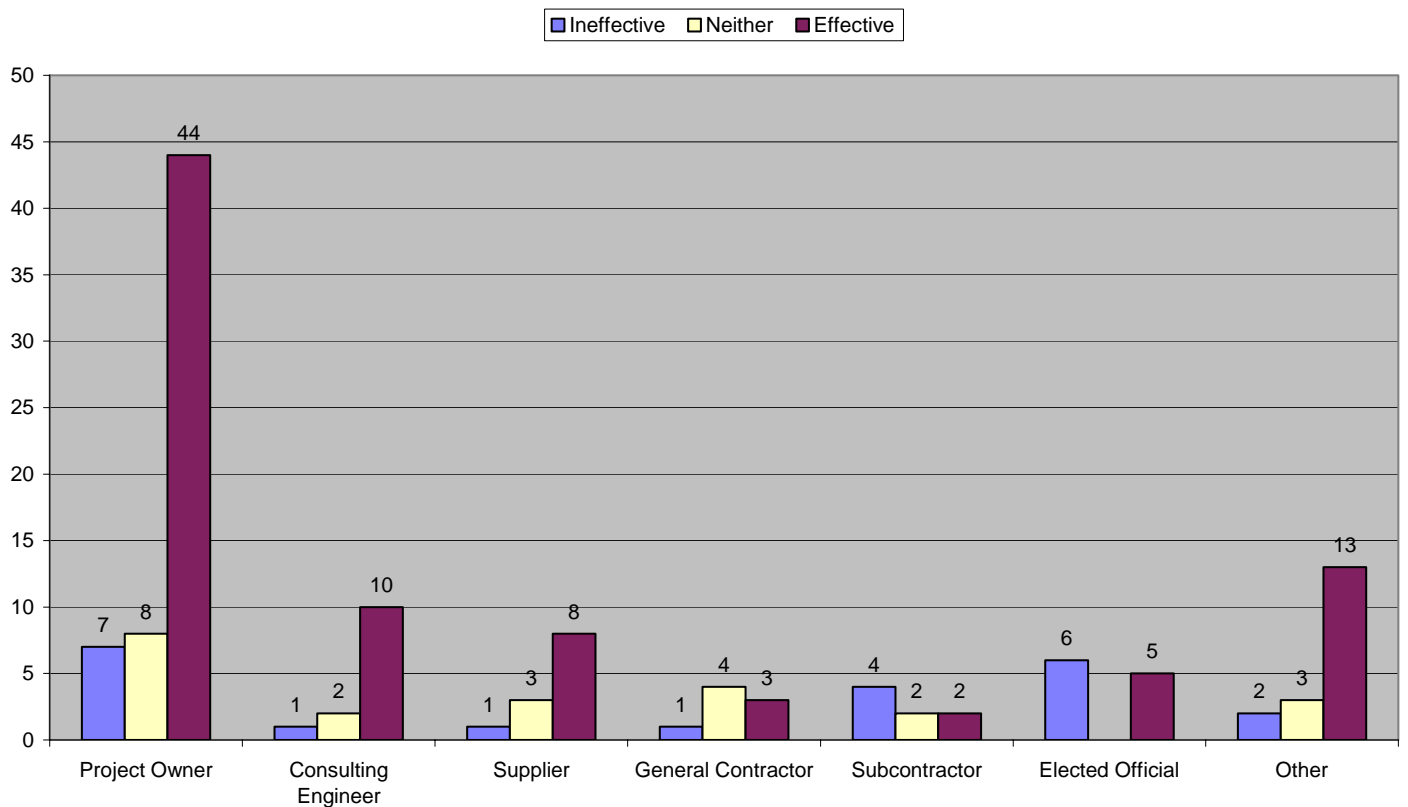
Solution B: Use Contractor in Design Process
Voting by Demographic Breakdown



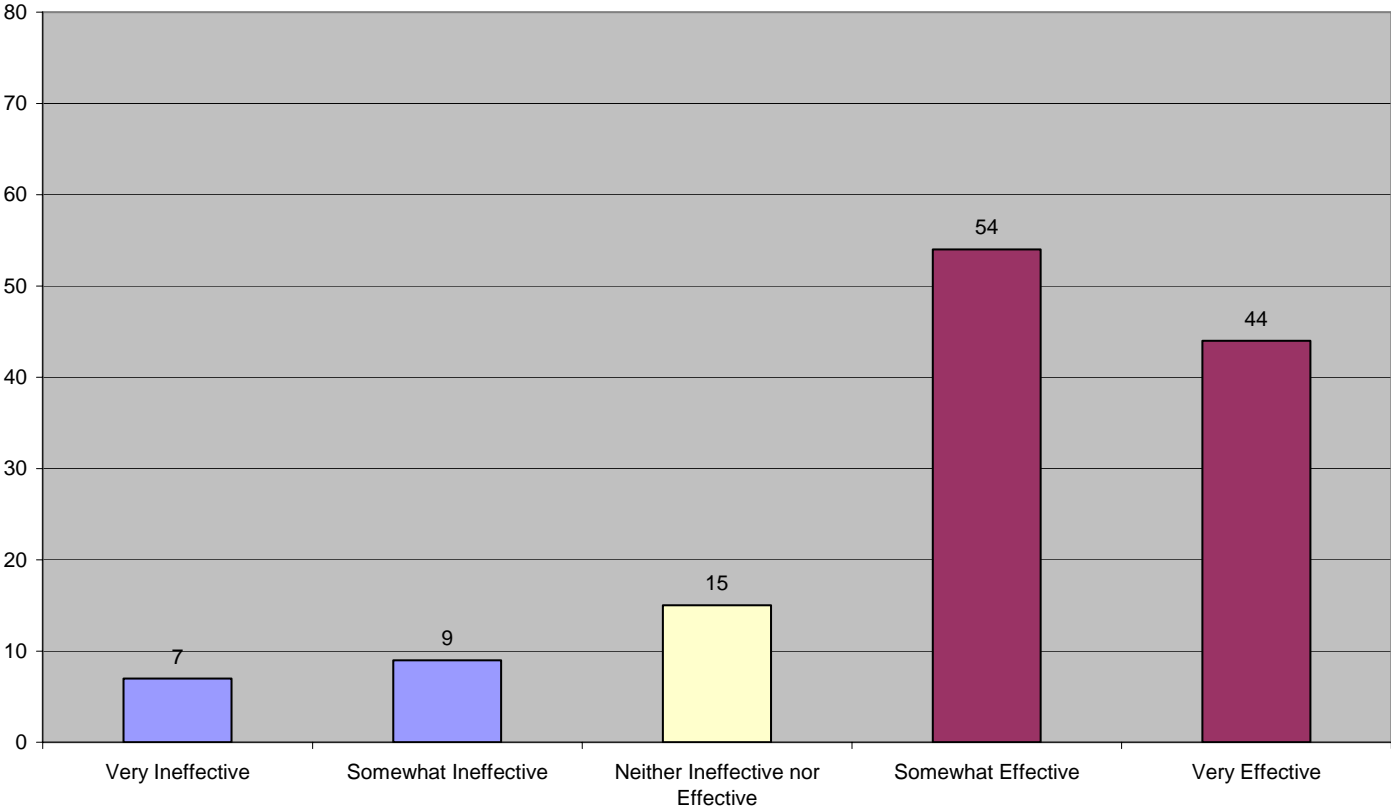
Solution C: Prepurchase Land and Materials Total Votes



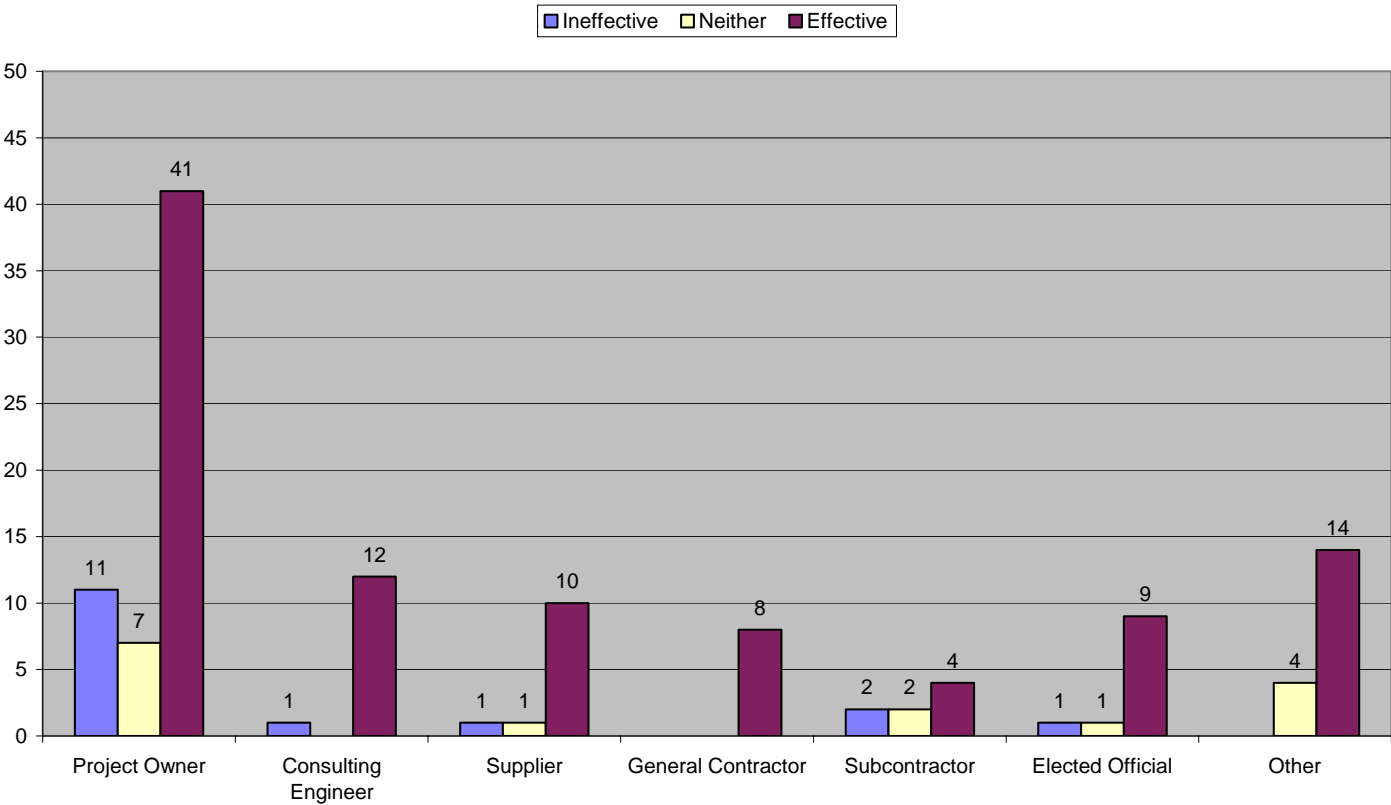
Solution C: Prepurchase Land & Materials Voting by Demographic Breakdown



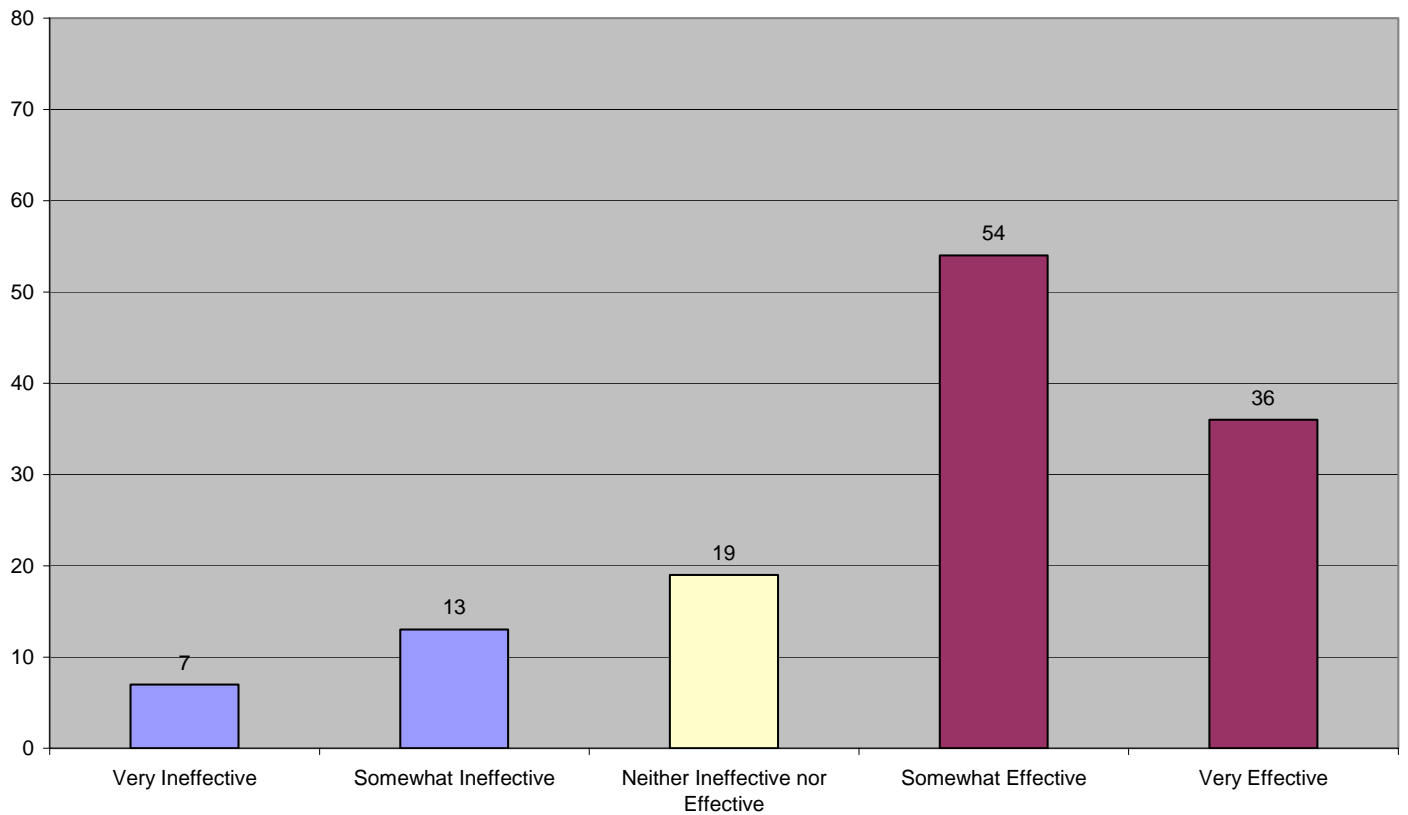
Solution D: Reduce Construction Process Time by Concurrently Completing Tasks
Total Votes



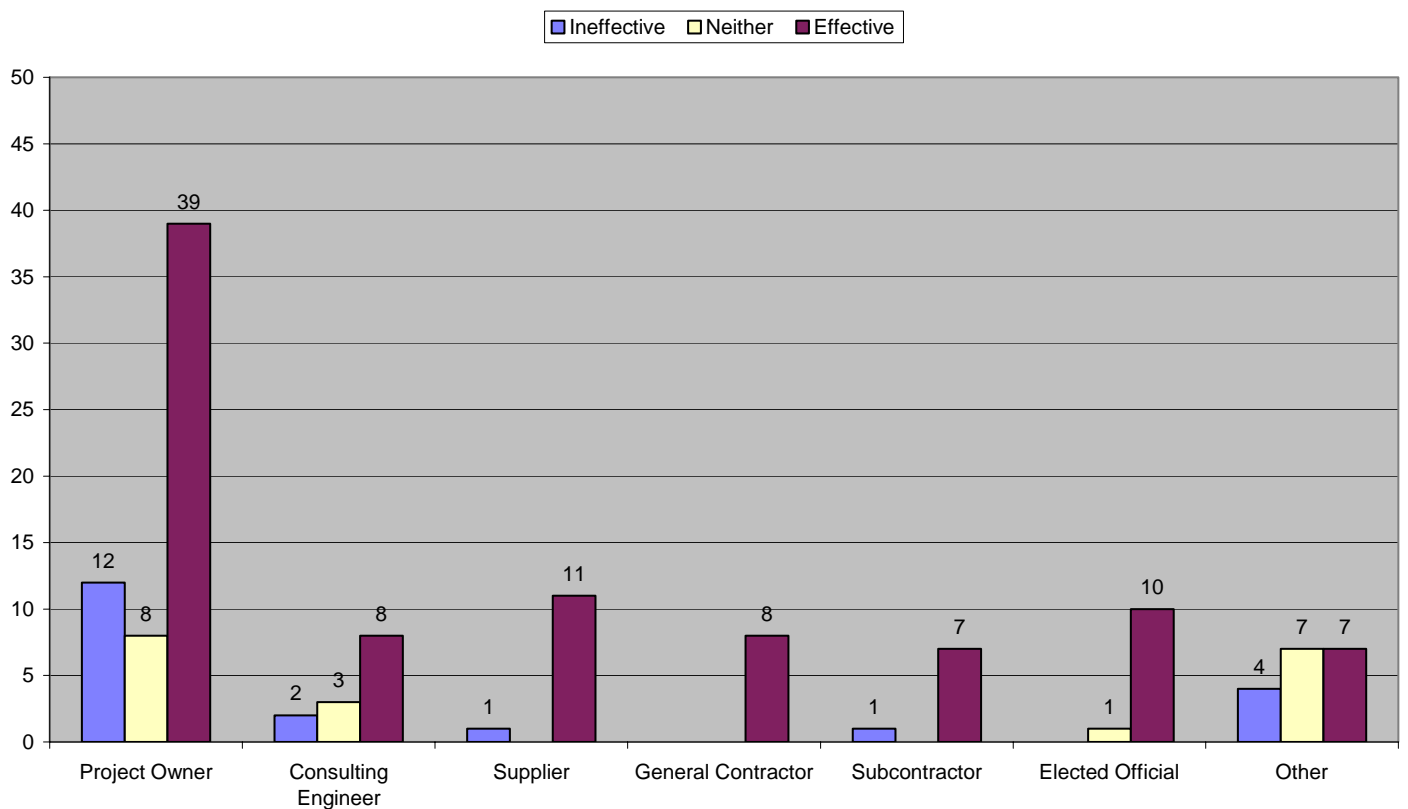
Solution D: Reduce Construction Process Time by Concurrently Completing Tasks
Voting by Demographic Breakdown



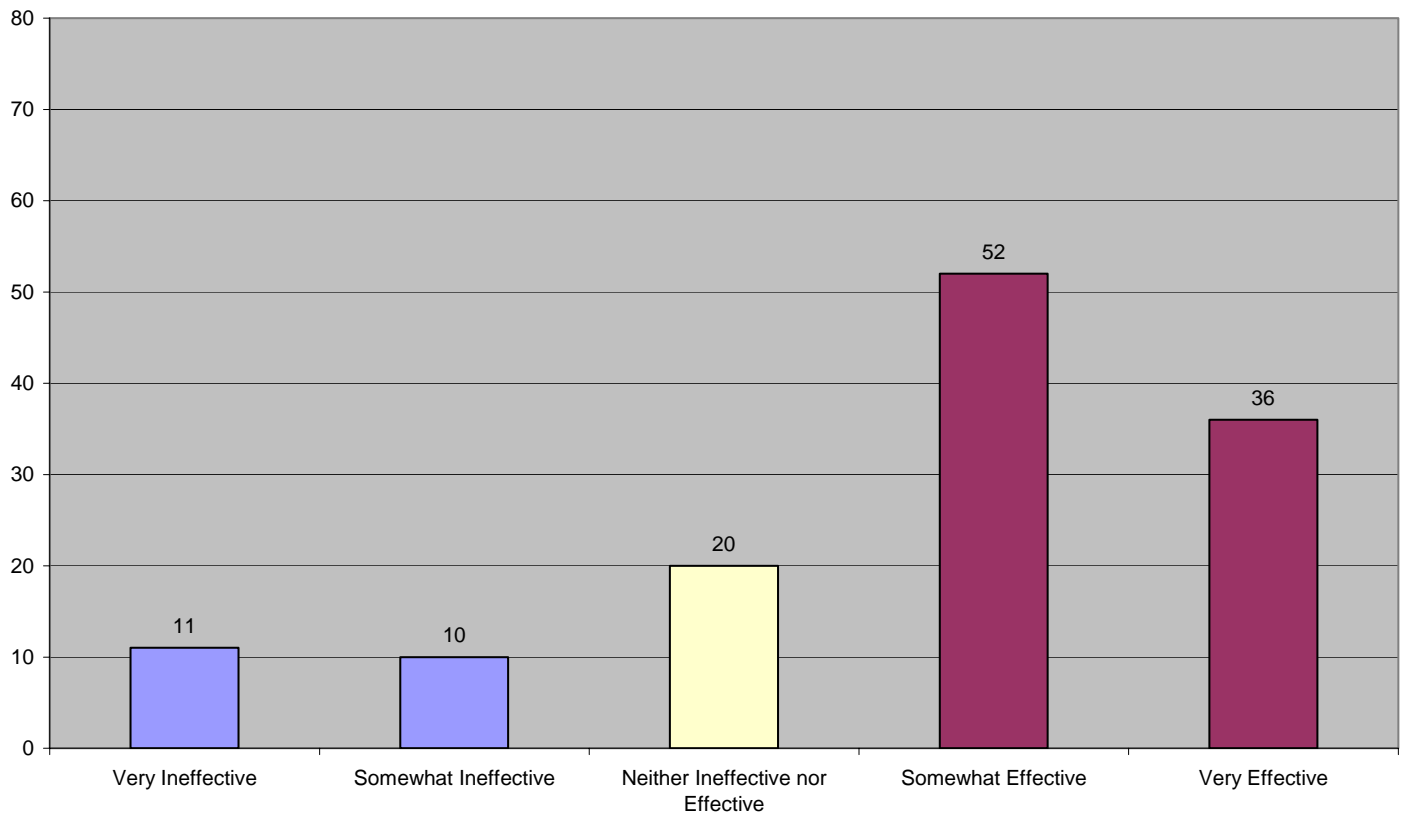
Solution E: Owners Share in Supply Price Risk
Total Votes



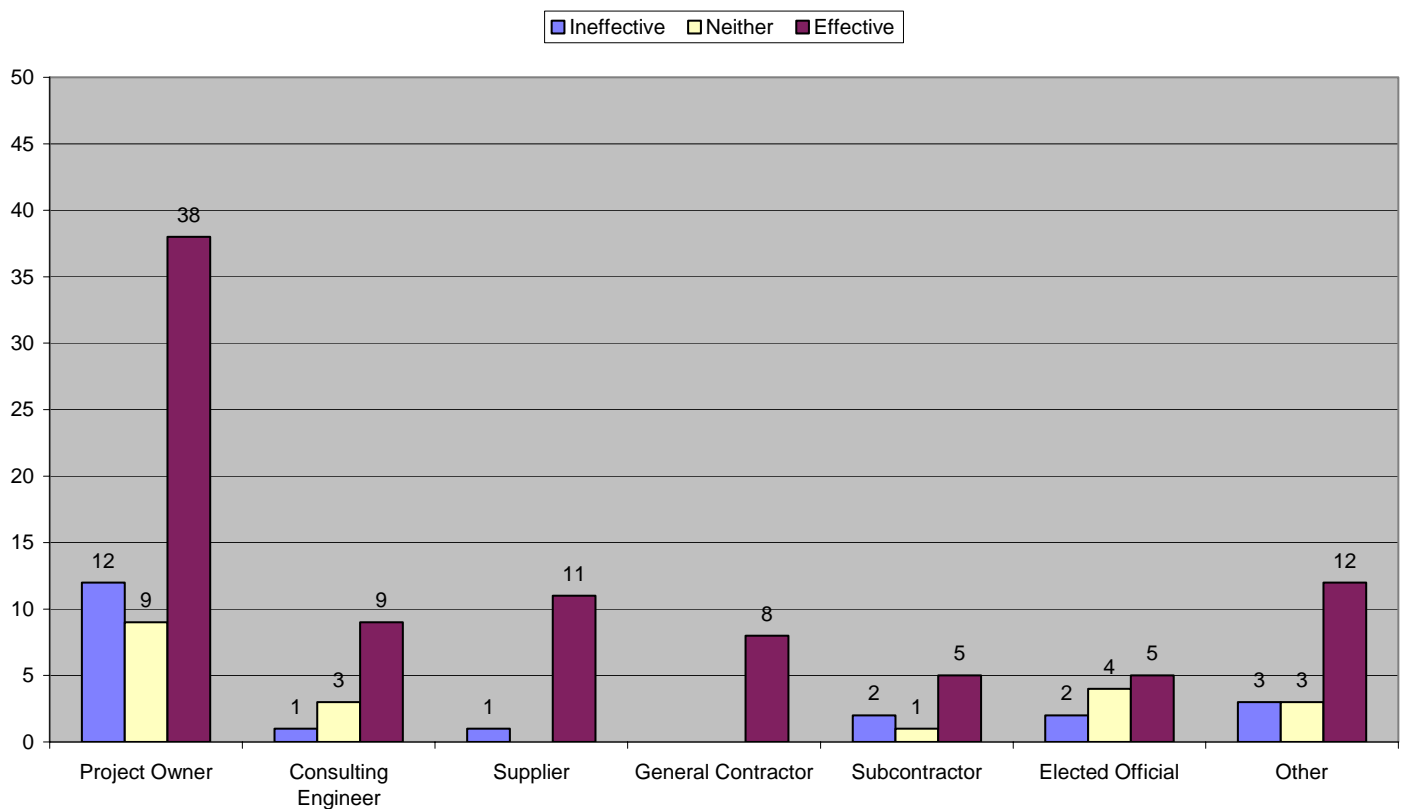
Solution E: Owners Share in Supply Price Risk
Voting by Demographic Breakdown



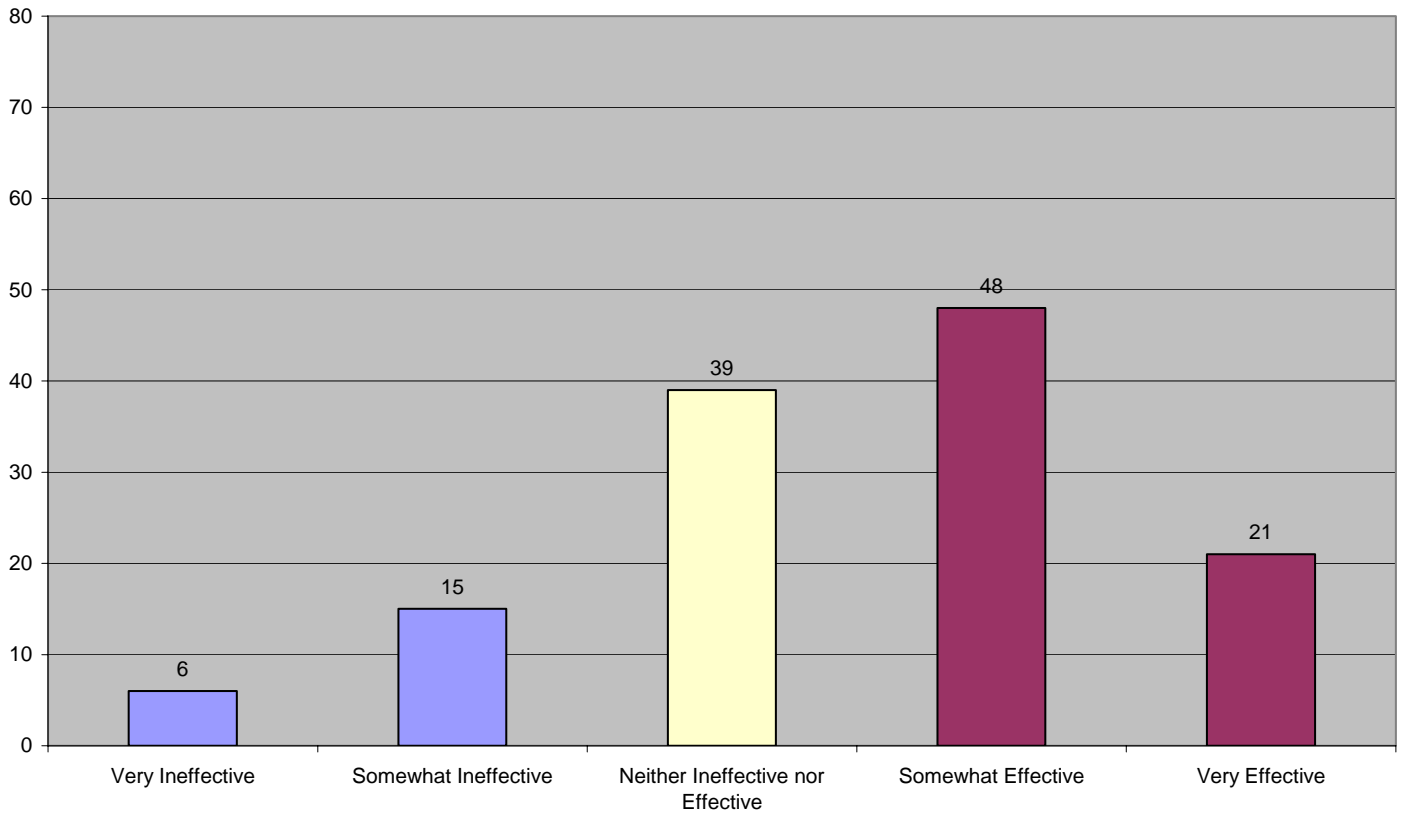
Solution F: Flexibility in Construction Contracts Total Votes



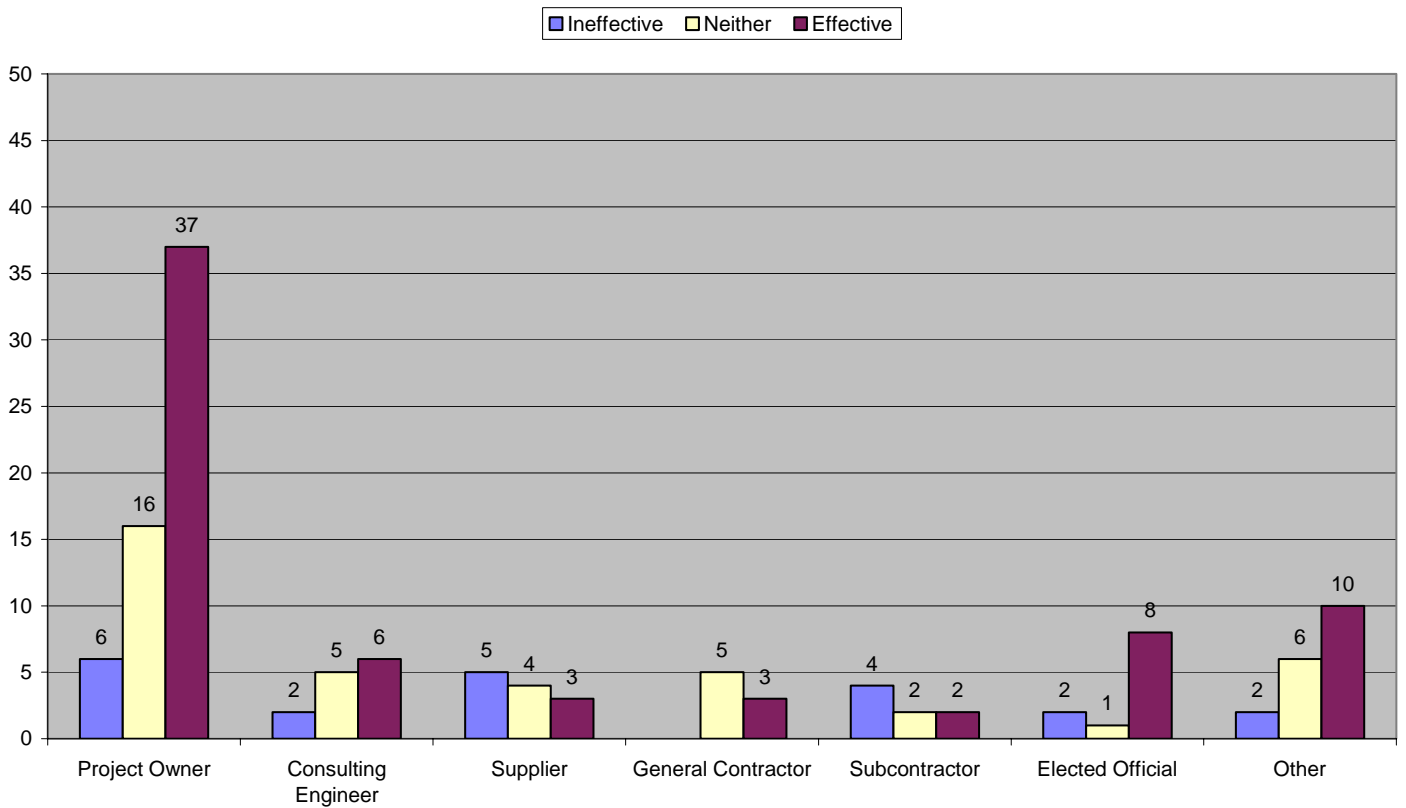
Solution F: Flexibility in Construction Contracts Voting by Demographic Breakdown



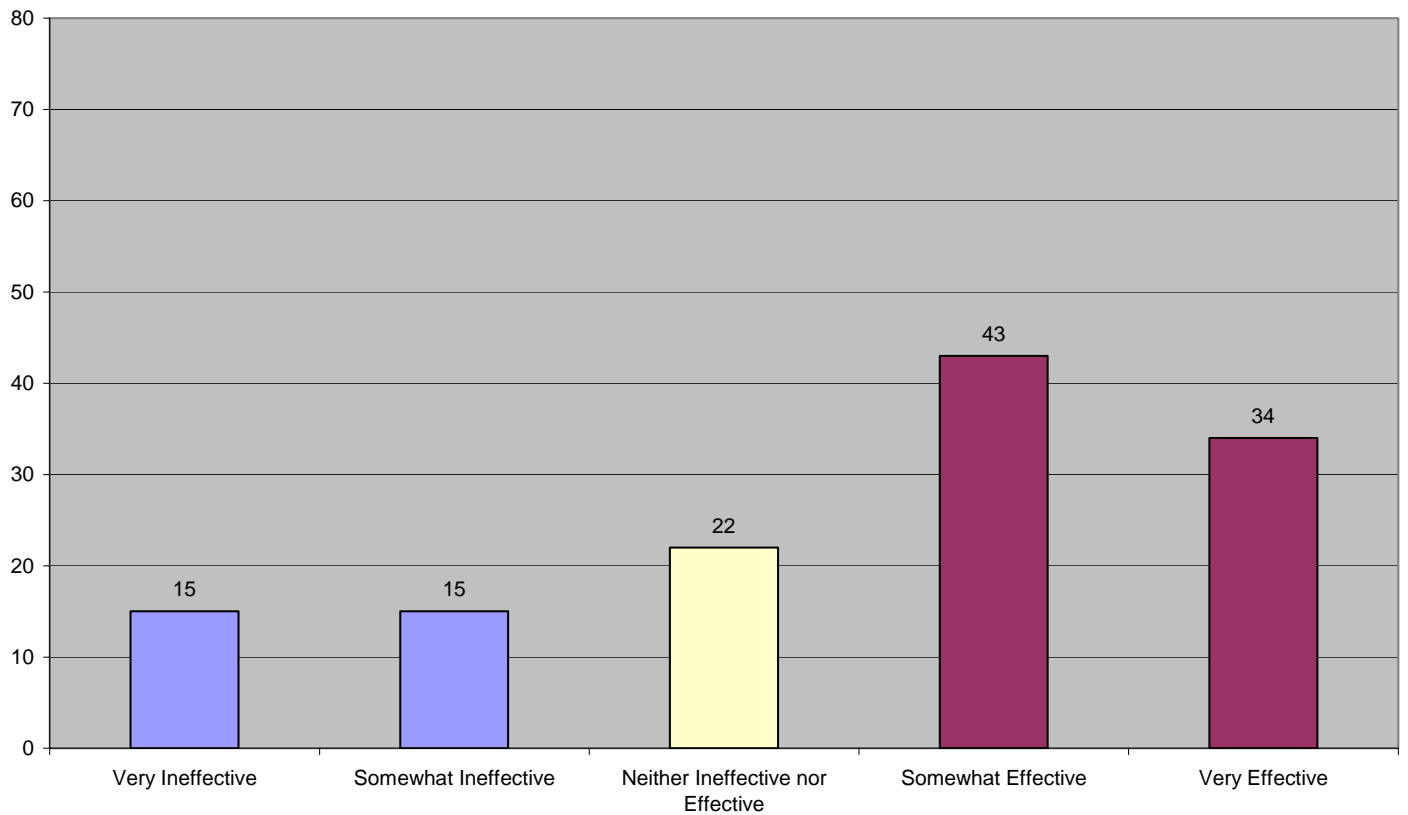
Solution G: Package Multiple Projects Together
Total Votes



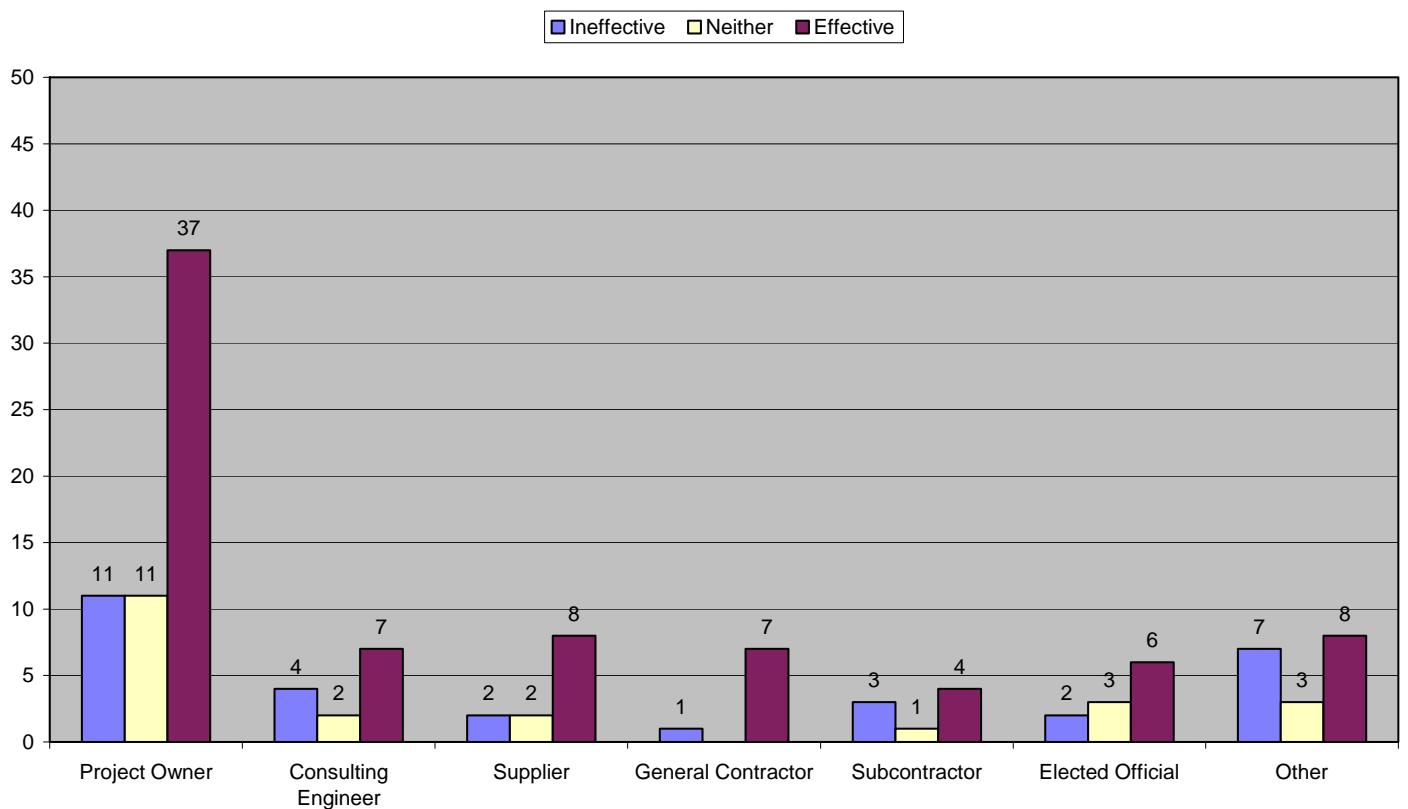
Solution G: Package Multiple Projects Together
Voting by Demographic Breakdown



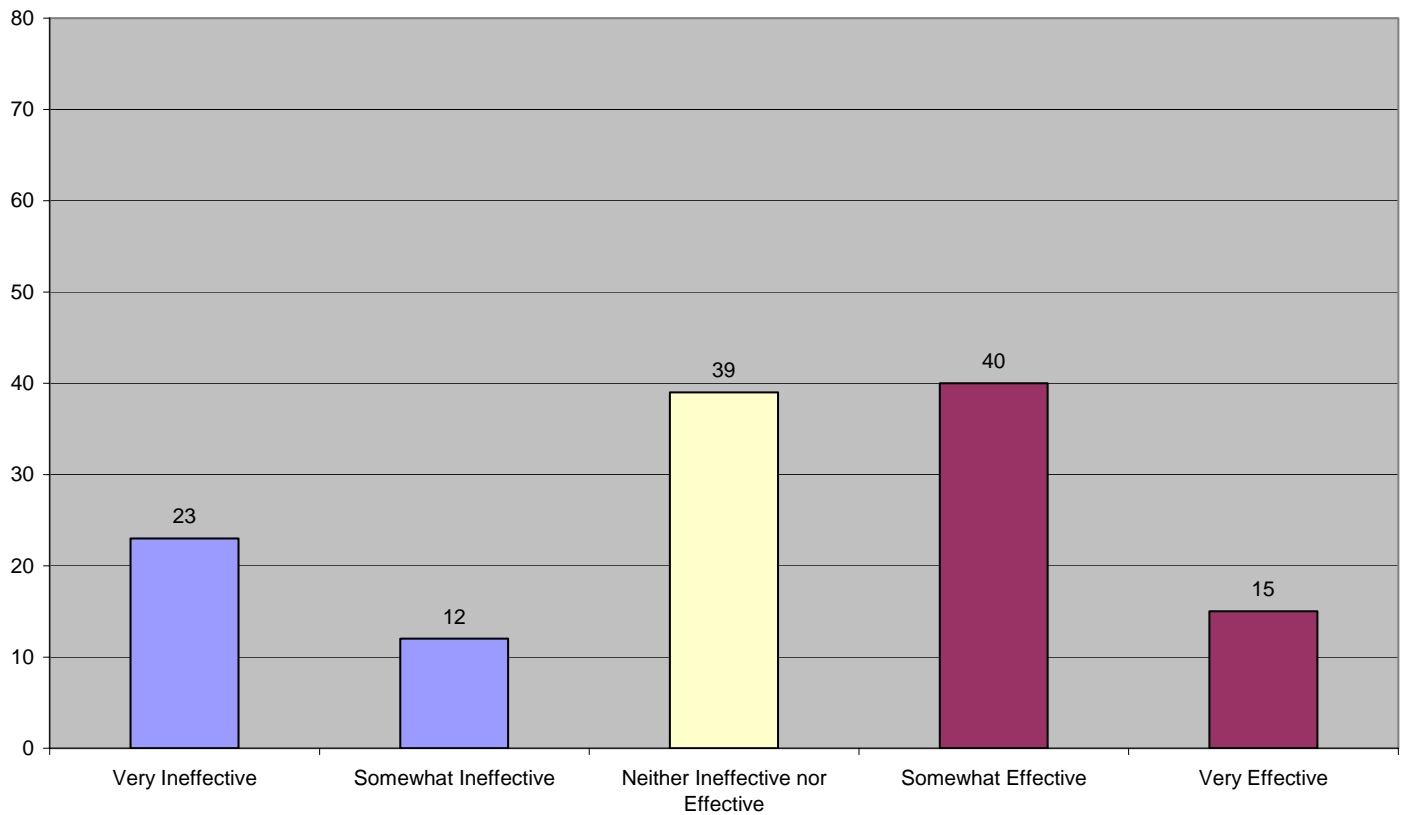
**Solution H: Index Materials
Total Votes**



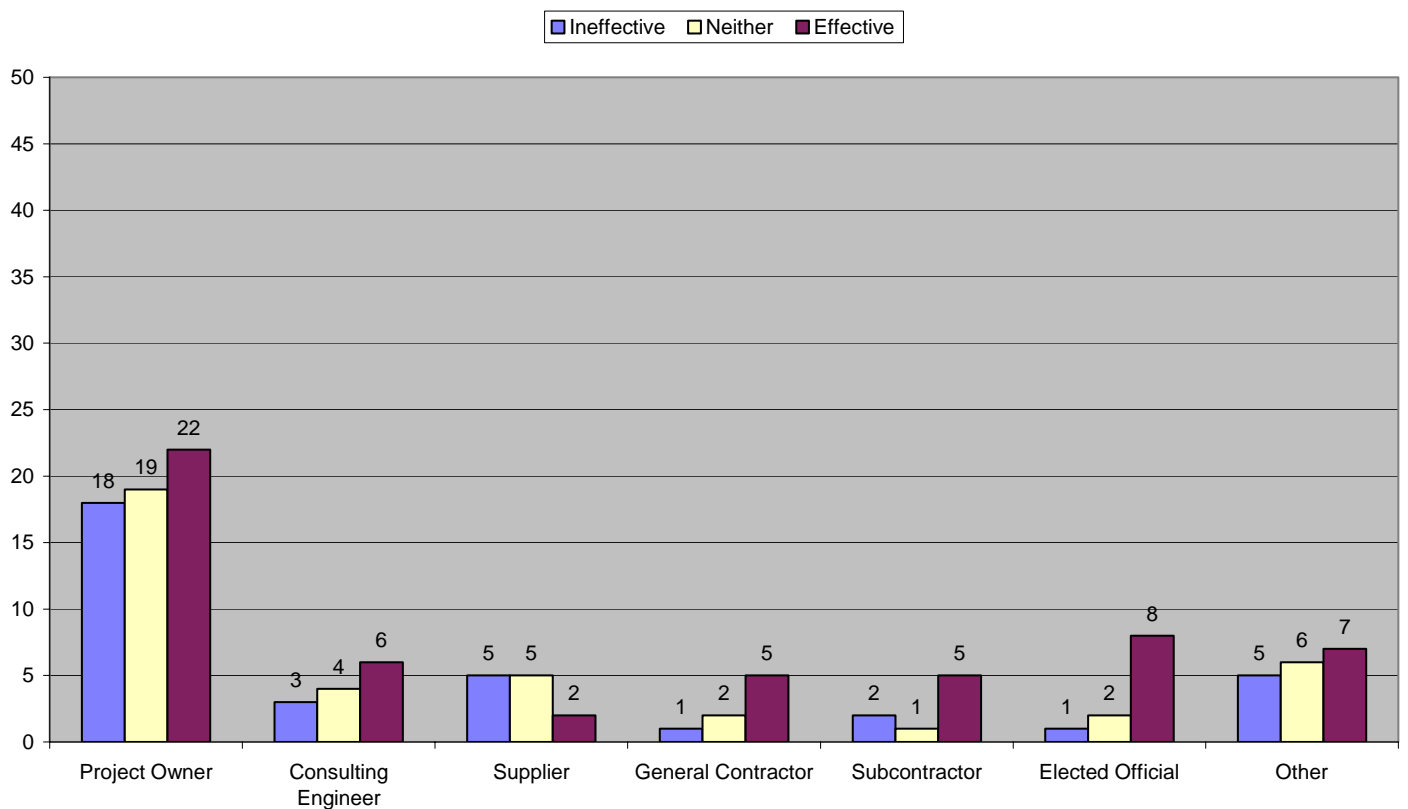
**Solution H: Index Materials
Voting by Demographic Breakdown**



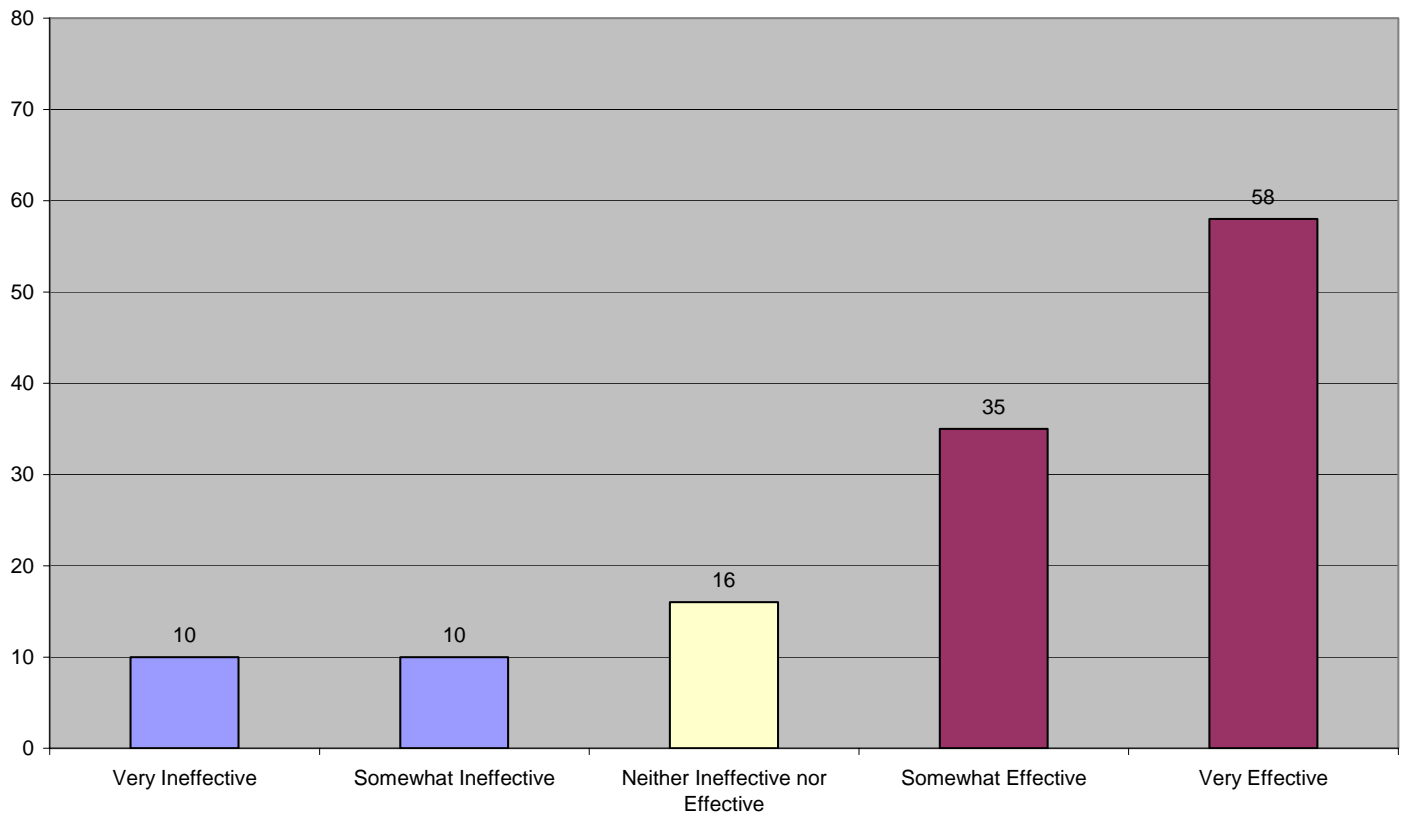
Solution I: Extend Alternative Bid Procurement to Subcontractors
Total Votes



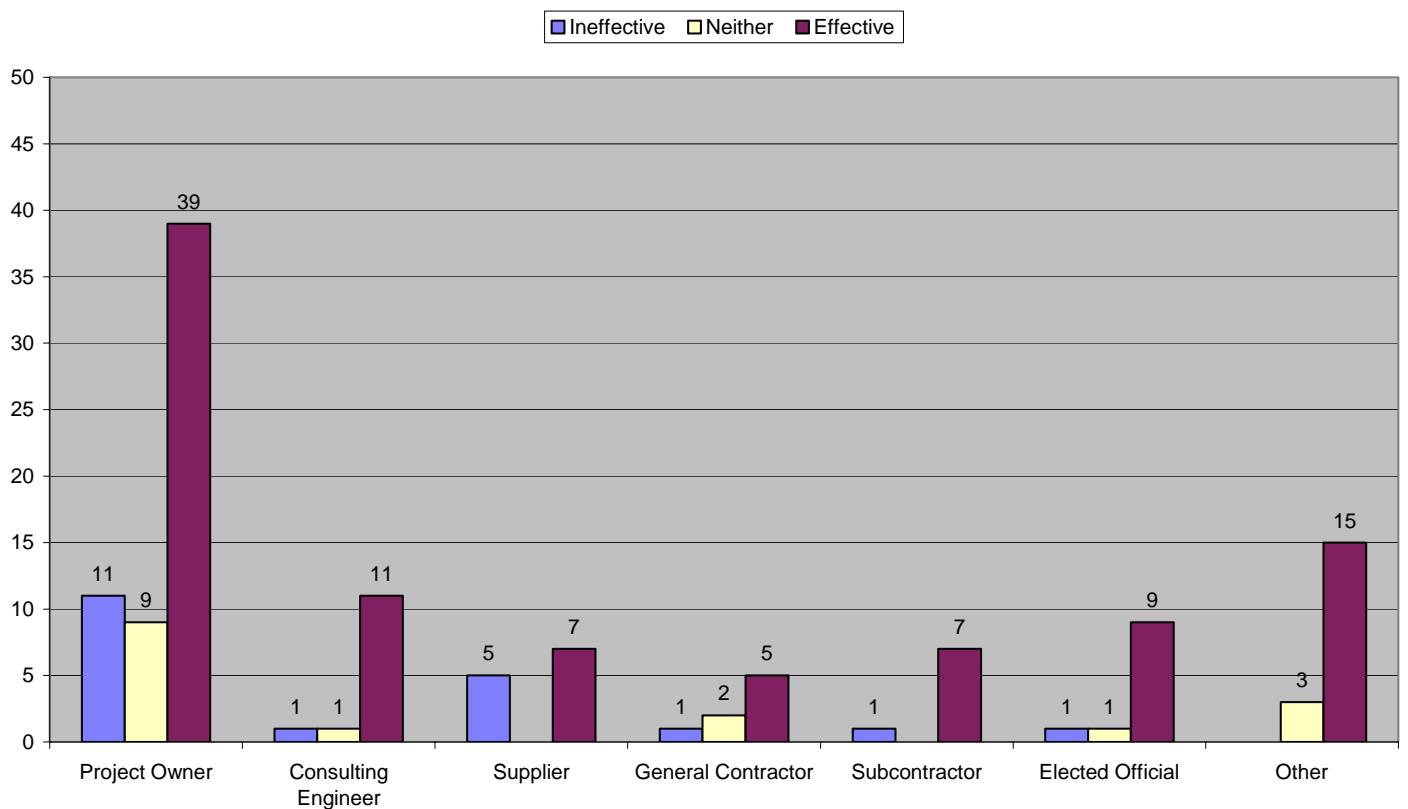
Solution I: Extend Alternative Bid Procurement to Subcontractors
Voting by Demographic Breakdown



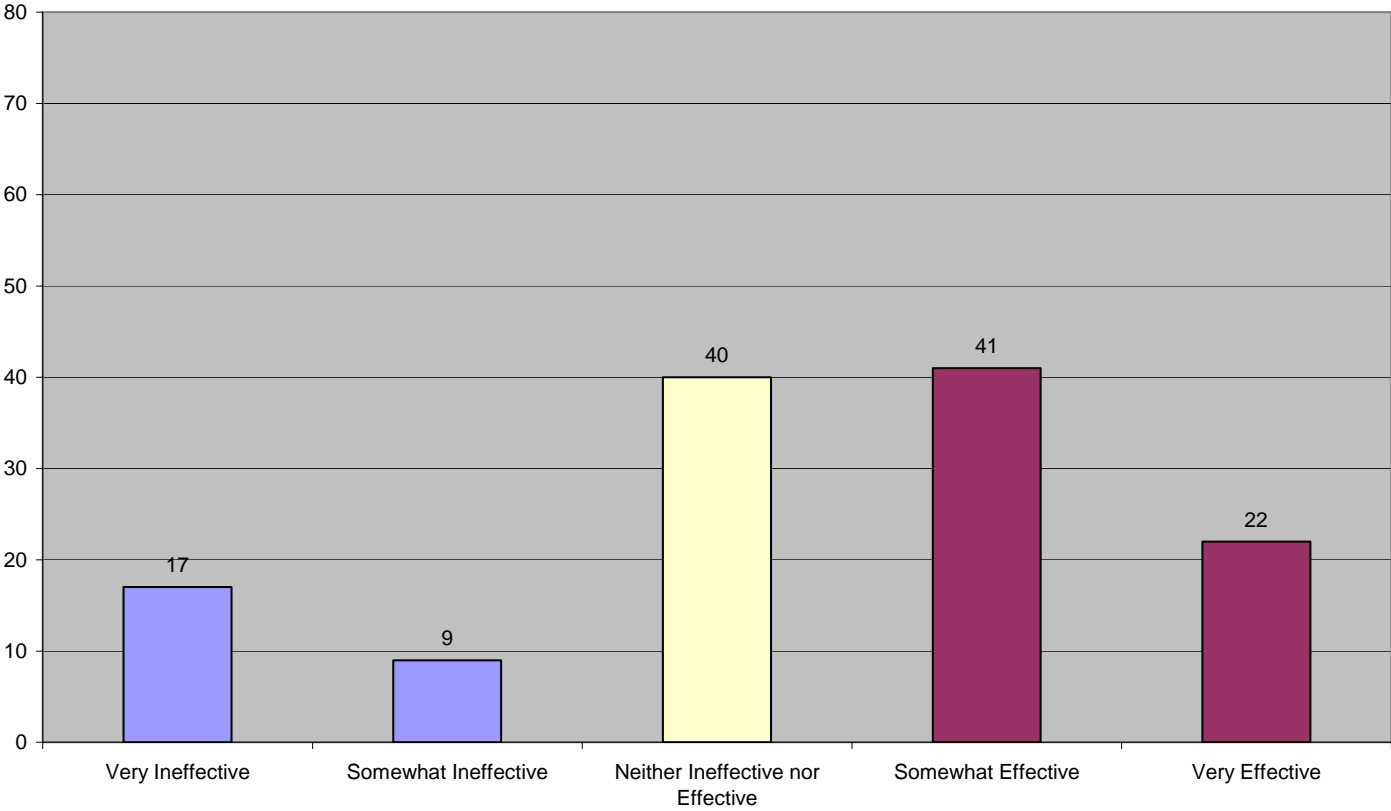
Solution J: Reduce Tariffs on Mexican Imported Materials
Total Votes



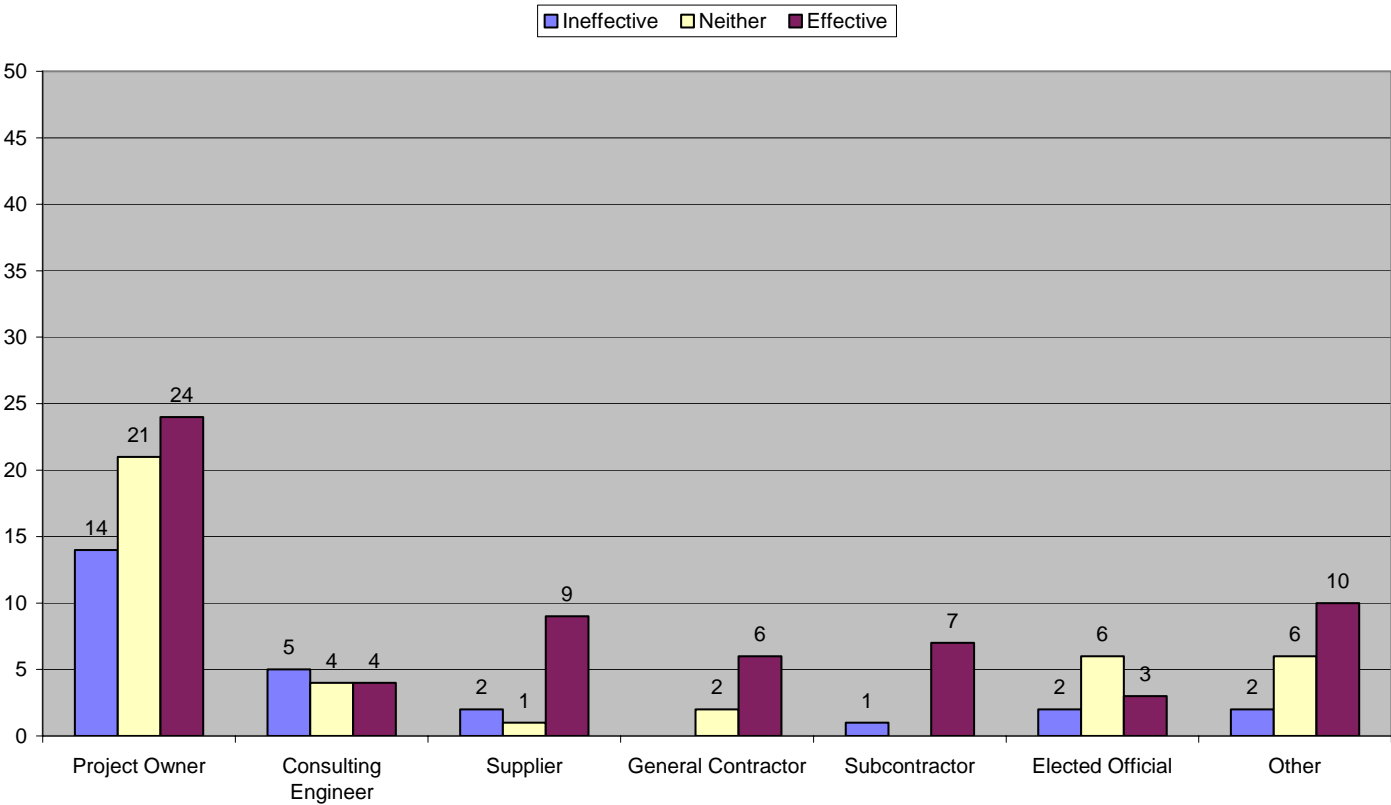
Solution J: Reduce Tariffs on Mexican Imported Materials
Voting by Demographic Breakdown



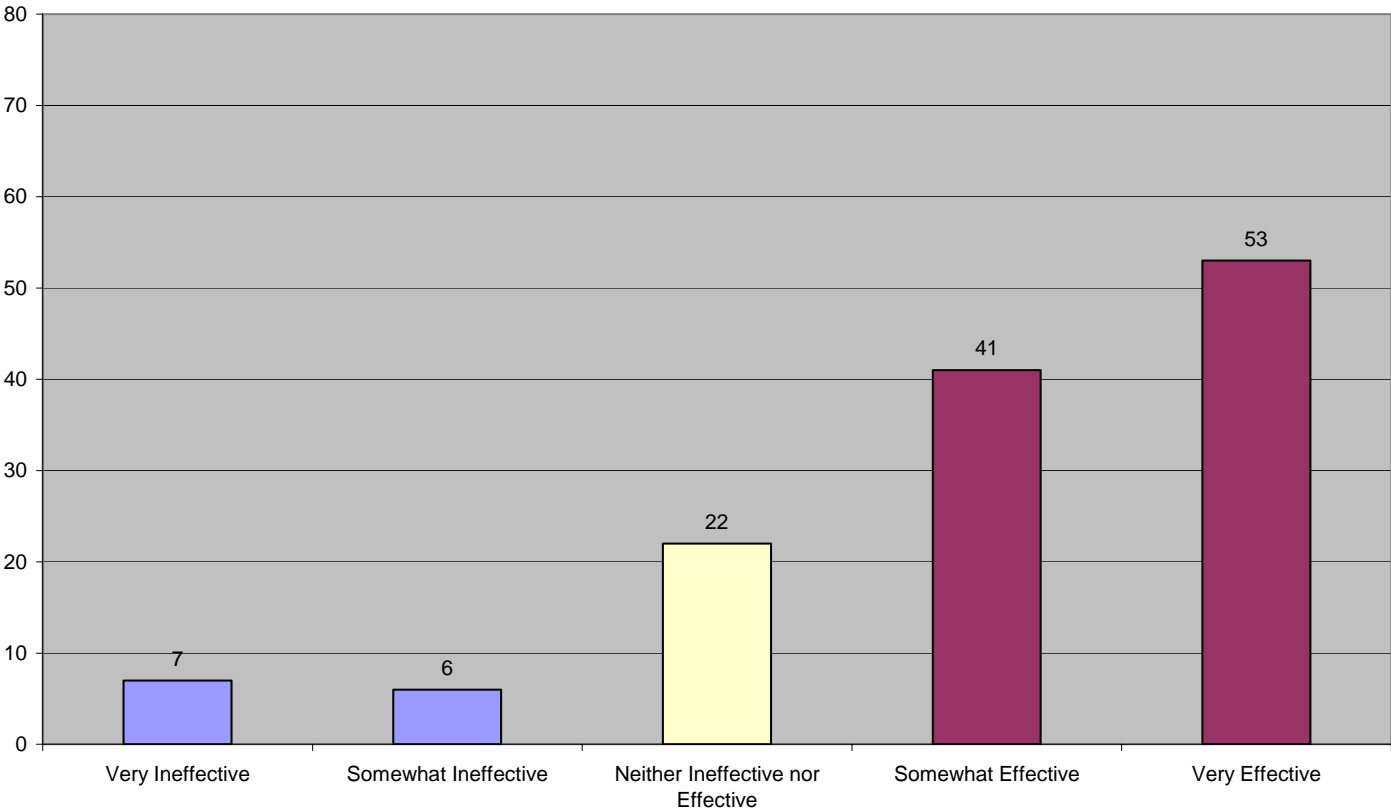
Solution K: Modify Bid and Appeal Process to Improve Productivity
Total Votes



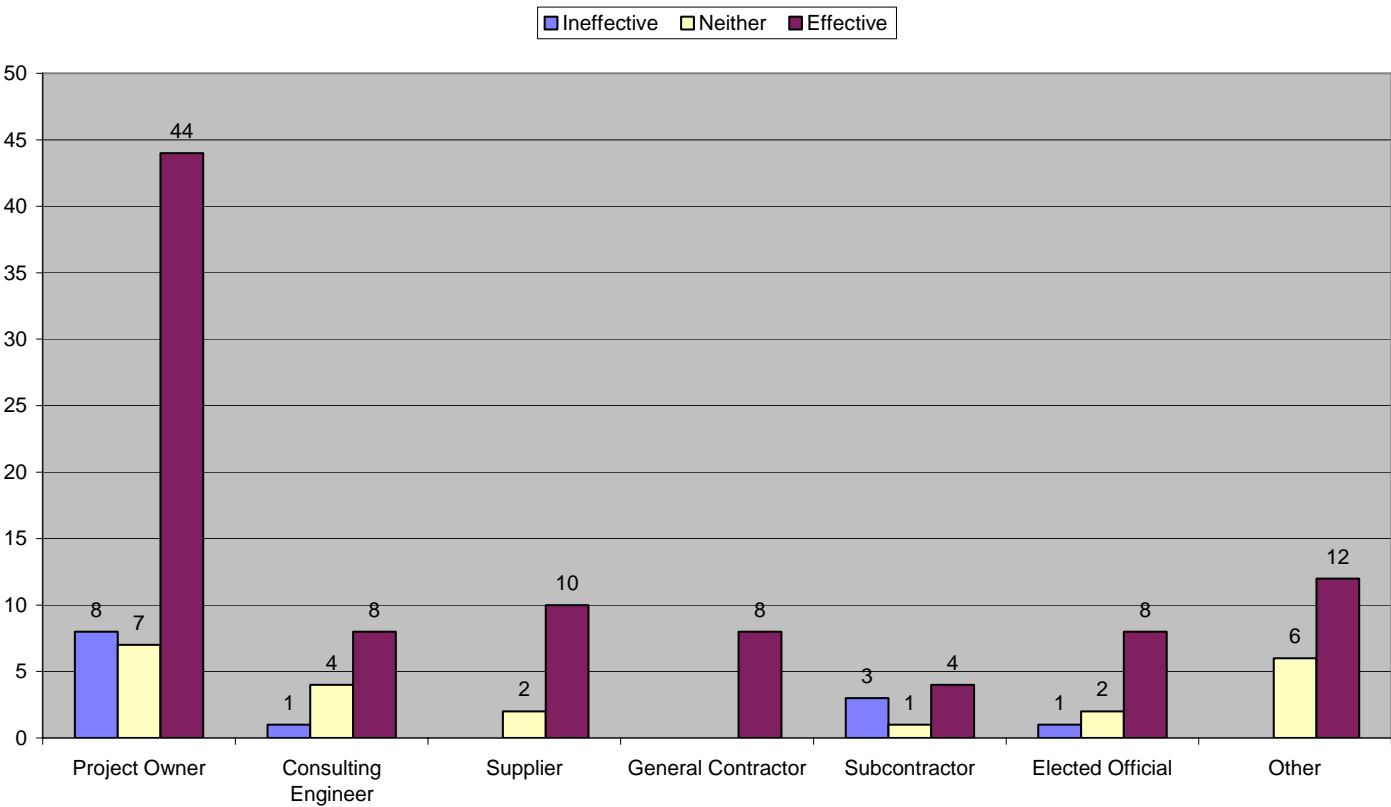
Solution K: Modify Bid and Appeal Process to Improve Productivity
Voting by Demographic Breakdown



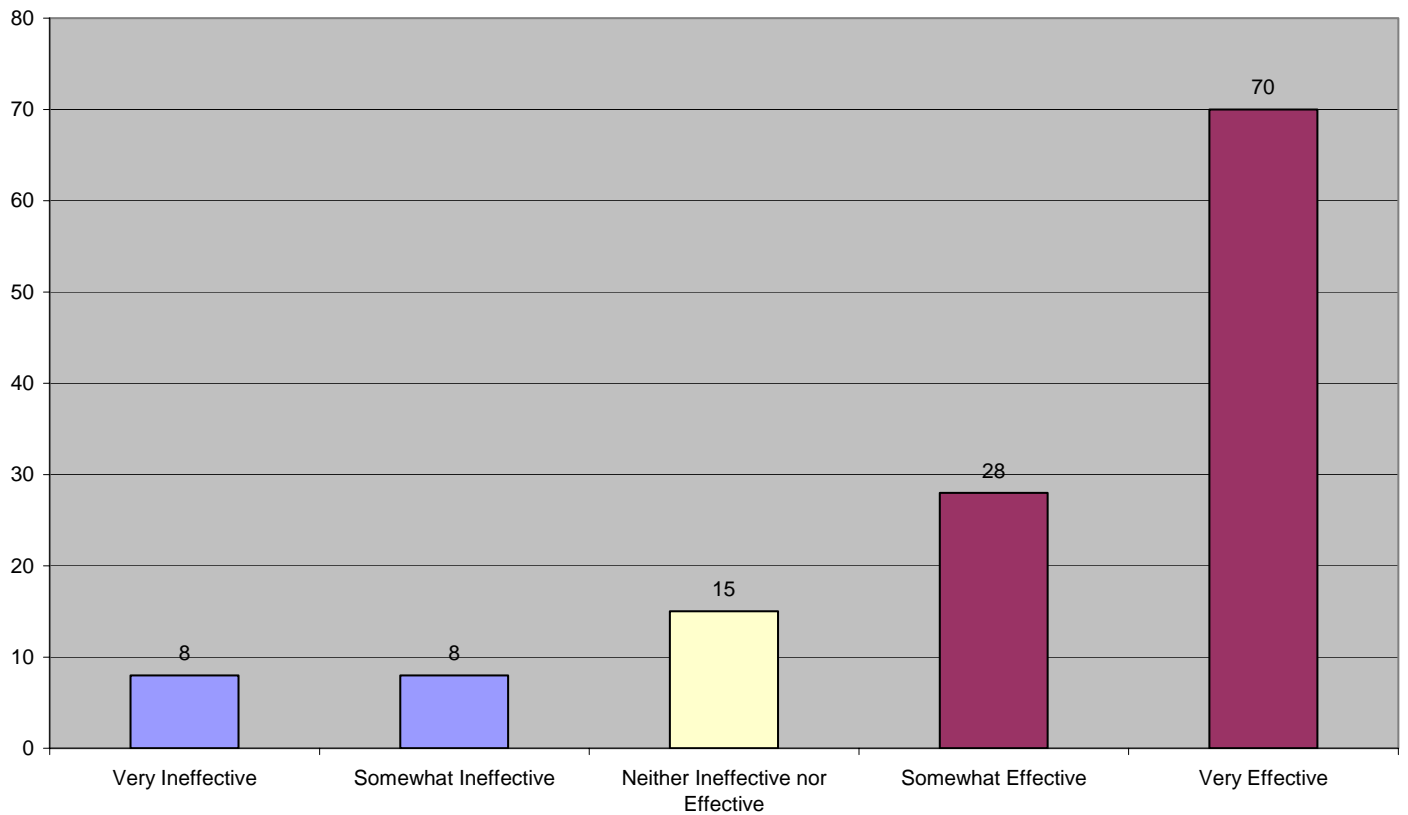
Solution L: Bring Key Stakeholders Together to Discuss Industry Issues
Total Votes



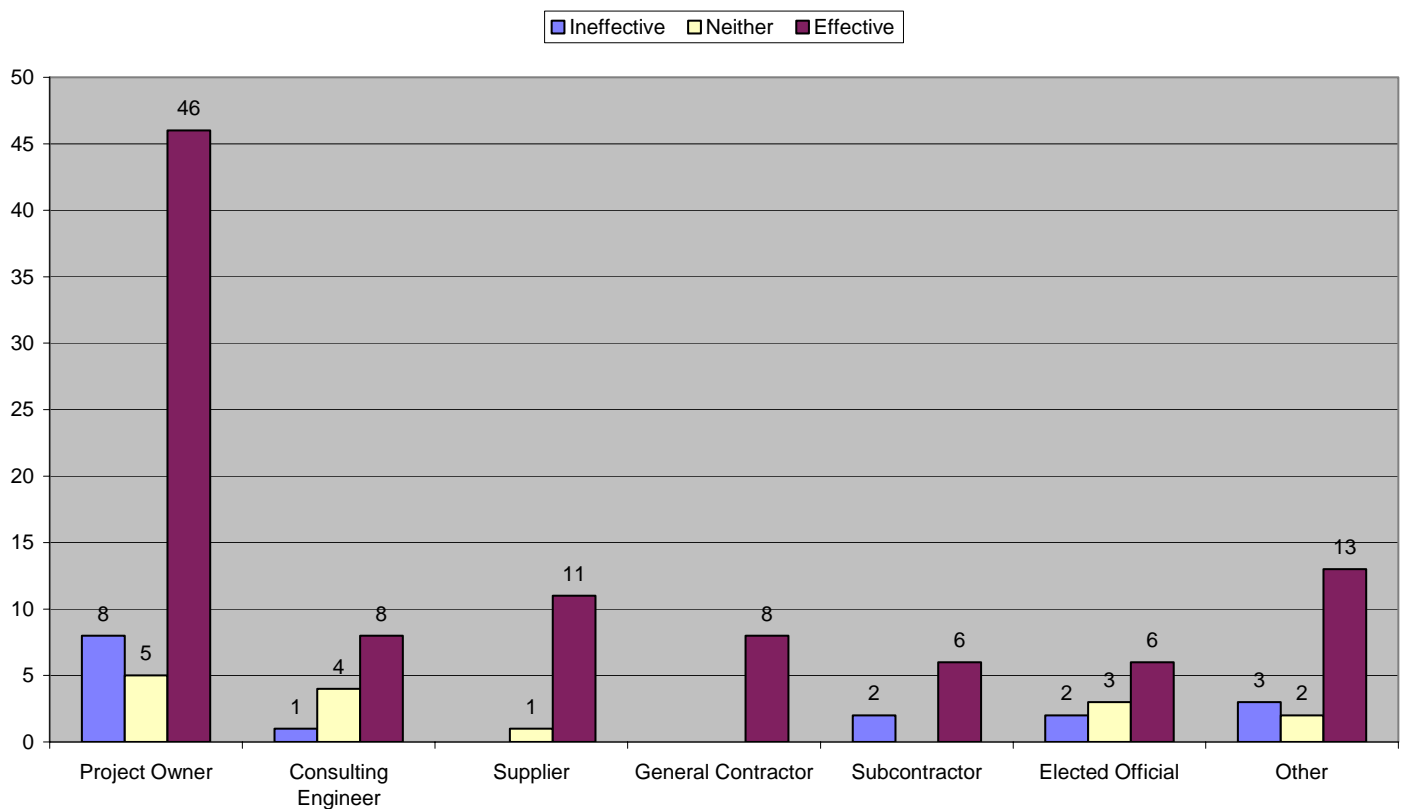
Solution L: Bring Key Stakeholders Together to Discuss Industry Issues
Voting by Demographic Breakdown



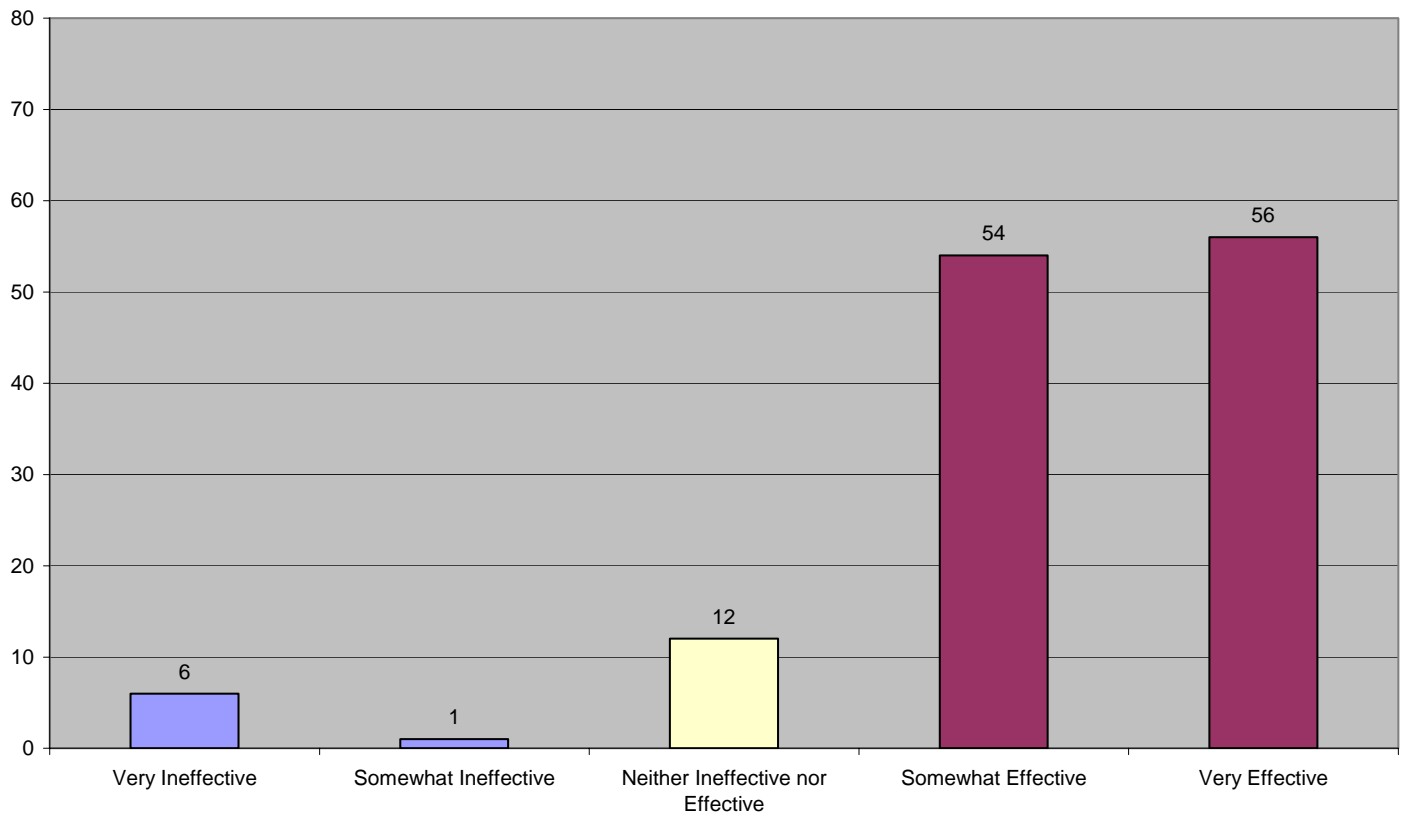
Solution M: Reduce Federal Review Process on Federally Funded Projects
Total Votes



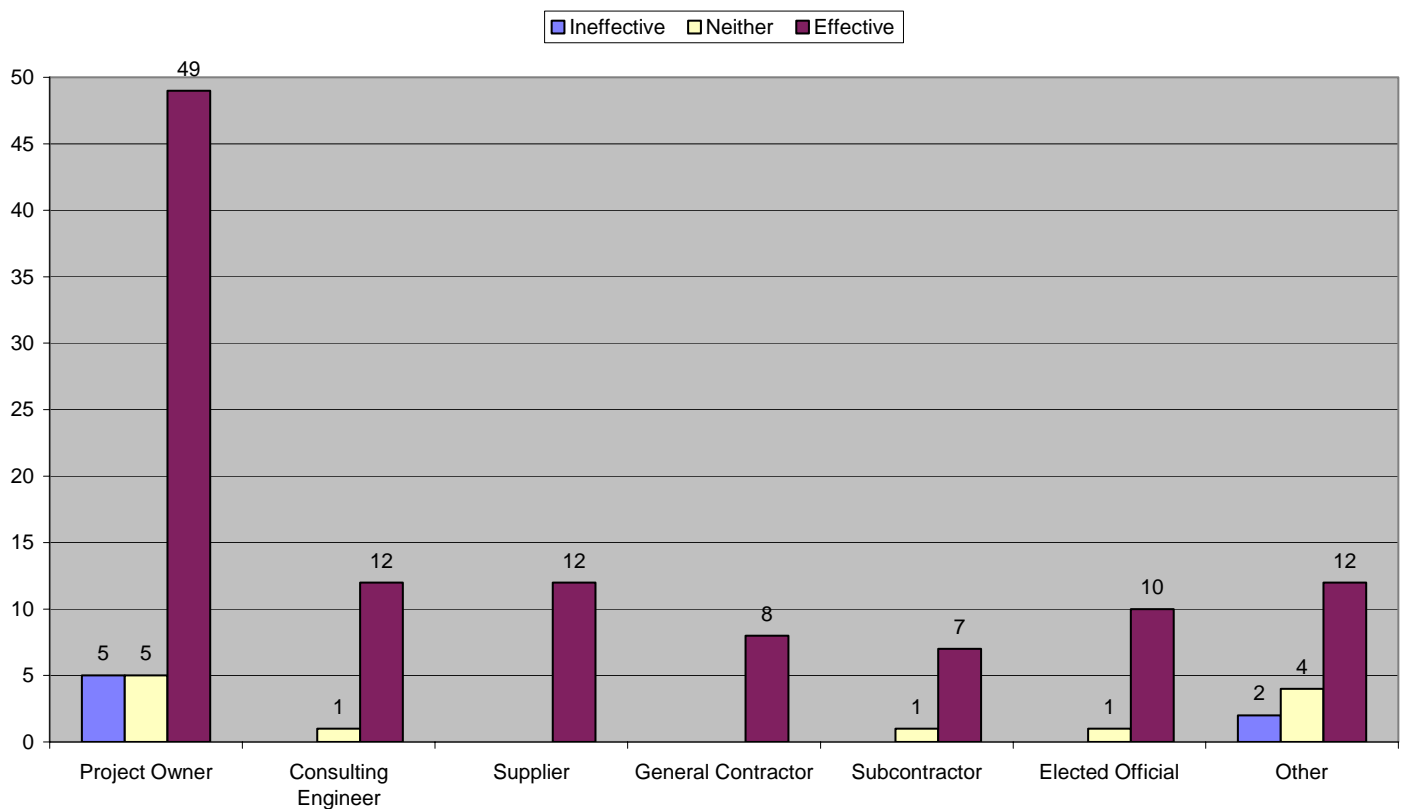
Solution M: Reduce Federal Review Process on Federally Funded Projects
Voting by Demographic Breakdown



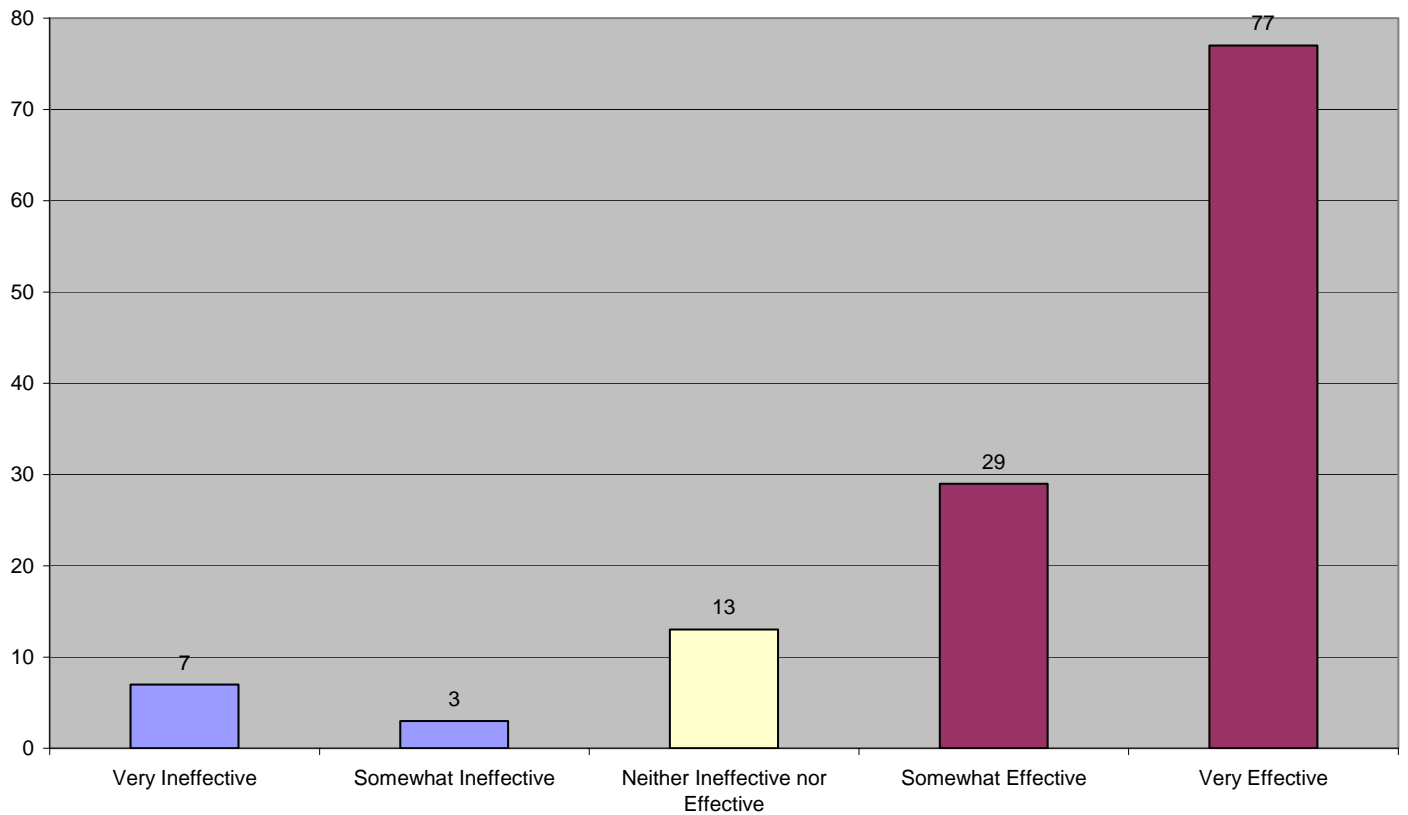
Solution N: Update Local and State Contract Provisions
Total Votes



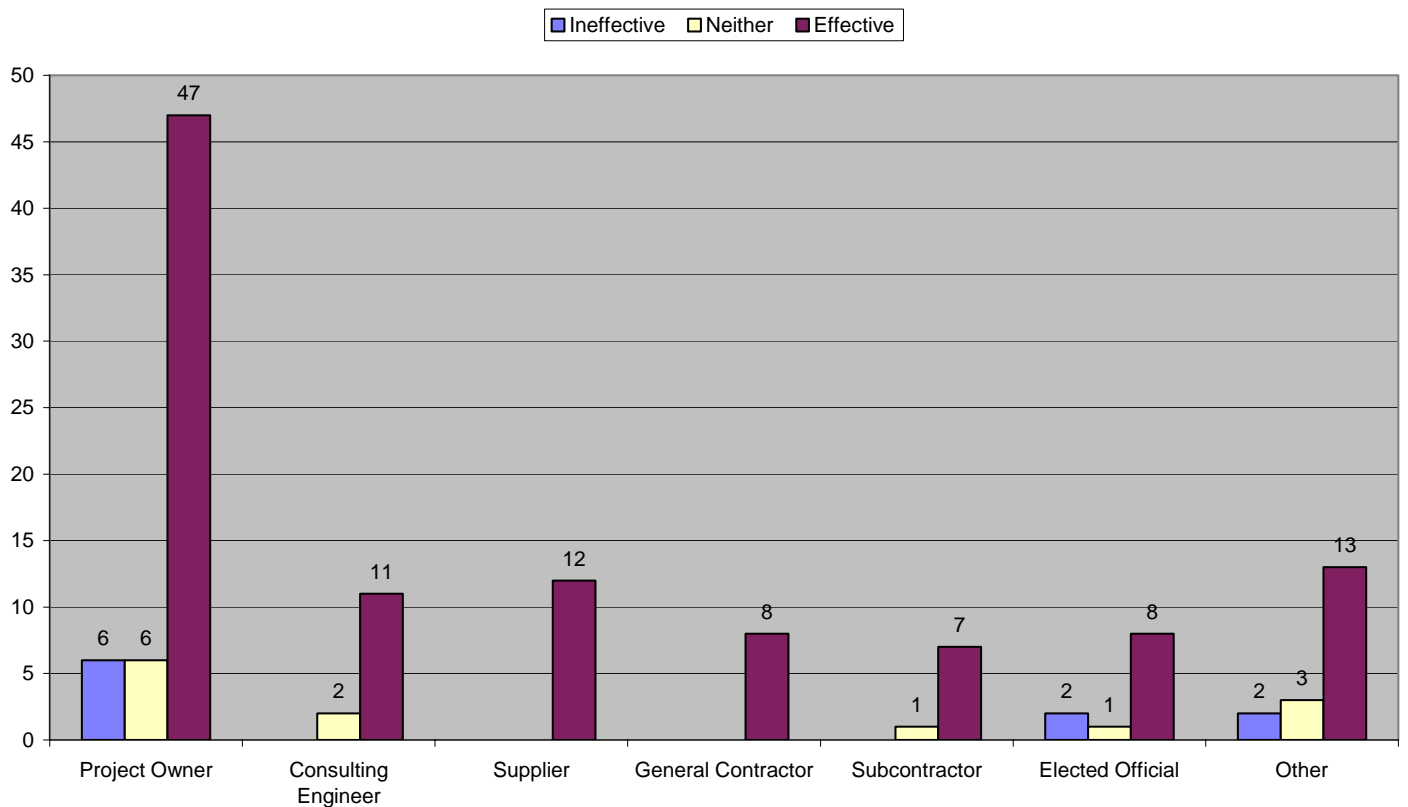
Solution N: Update Local and State Contract Provisions
Voting by Demographic Breakdown



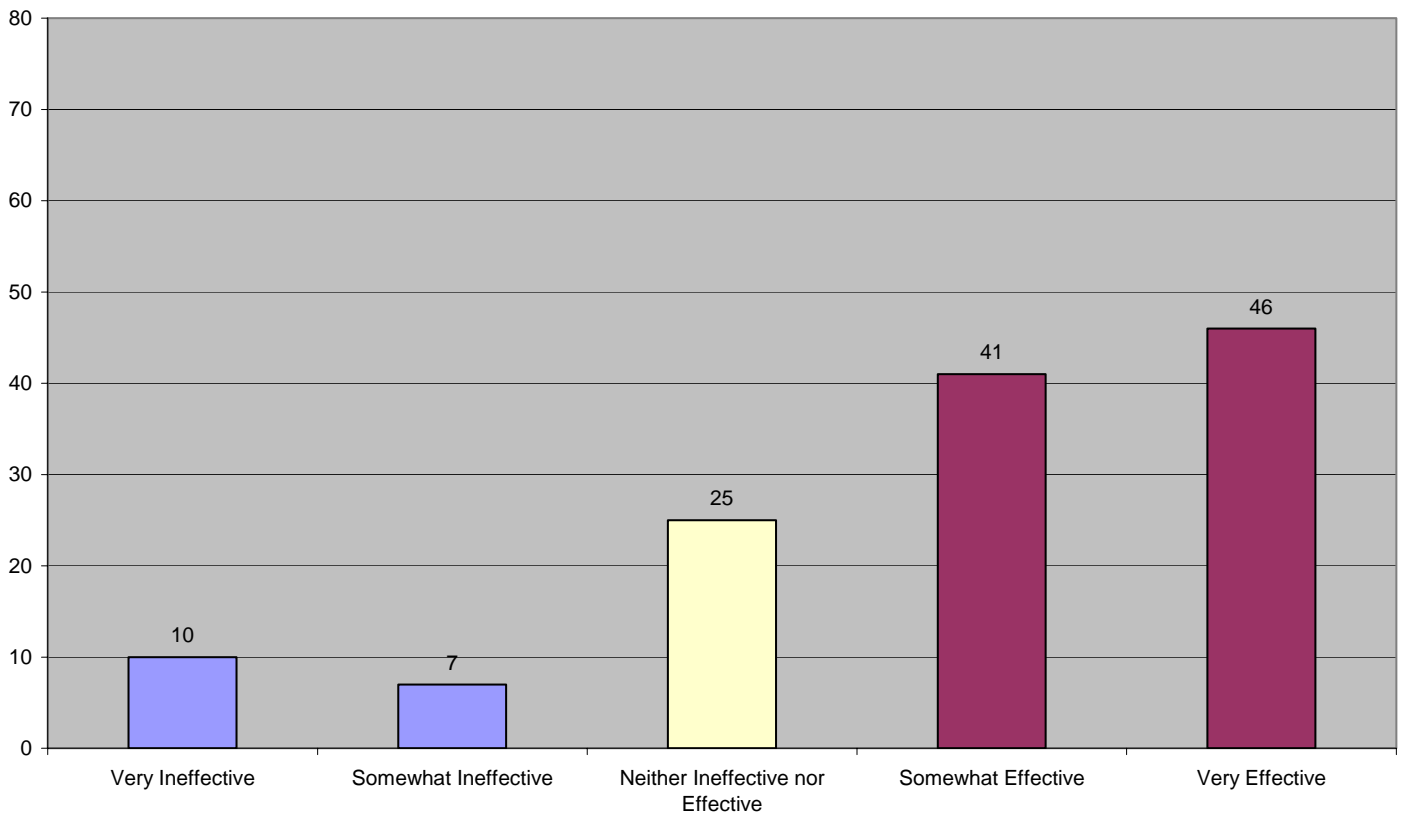
Solution O: Make Environmental Laws/Controls More User Friendly
Total Votes



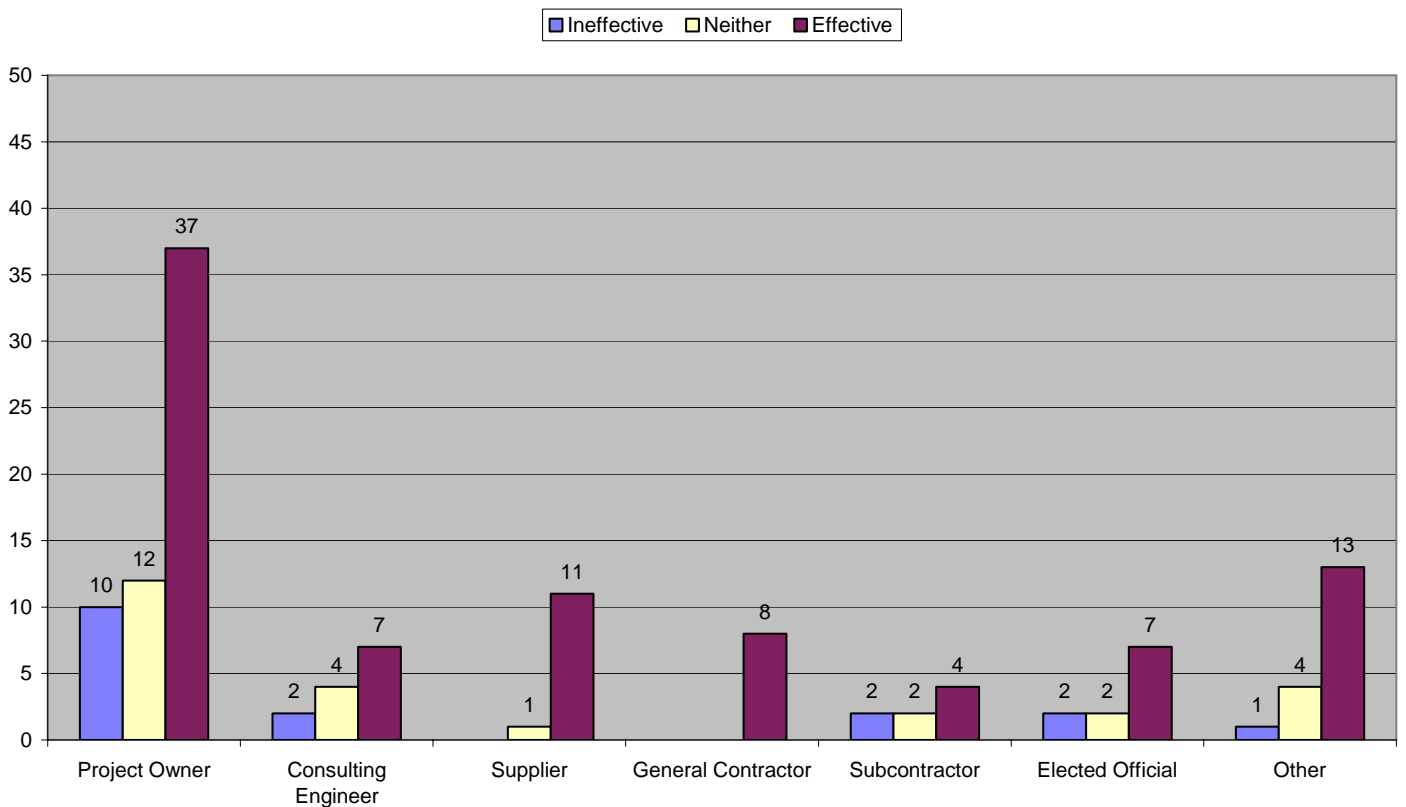
Solution O: Make Environmental Laws/Controls more User Friendly
Voting by Demographic Breakdown



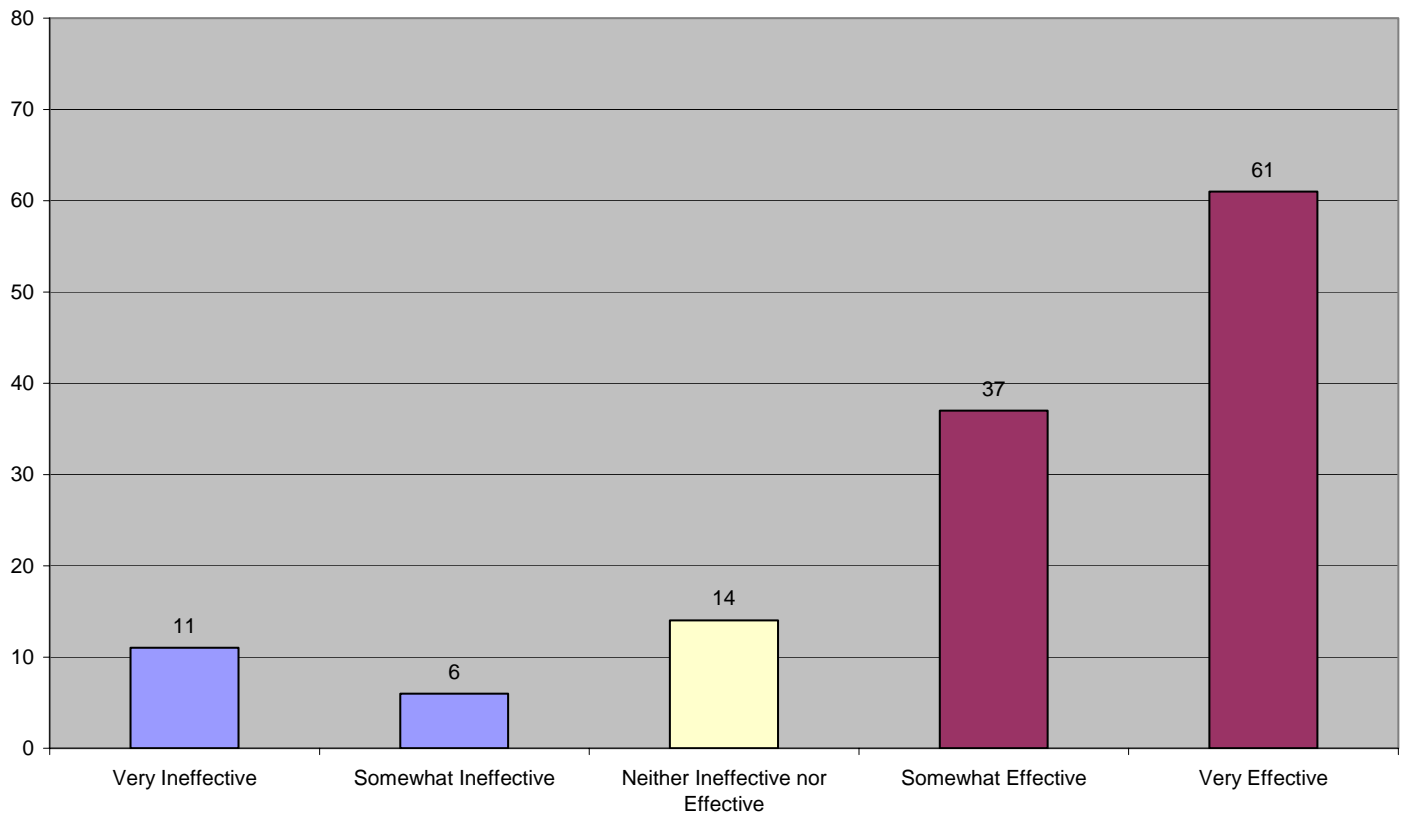
Solution P: Increase Freight Rail Capacity
Total Votes



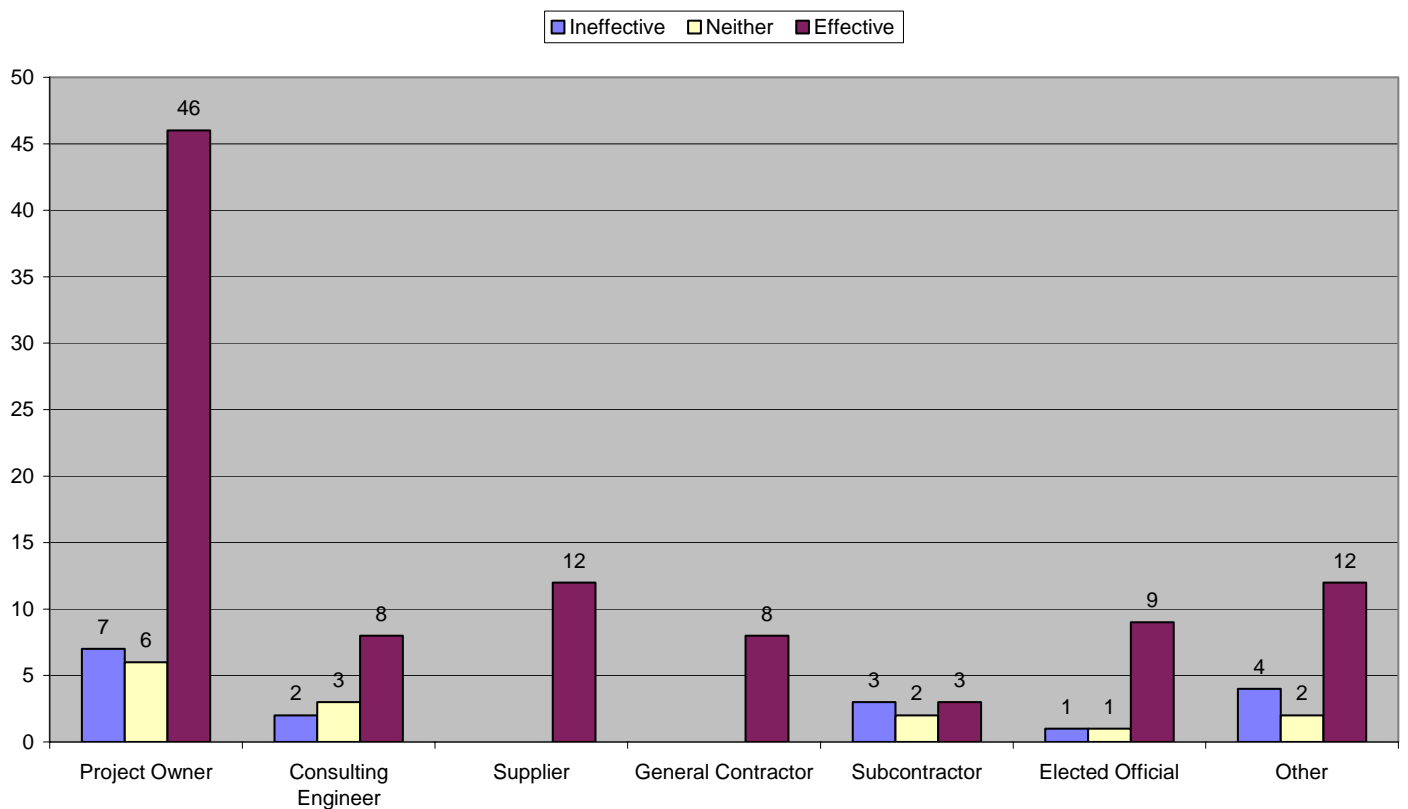
Solution P: Increase Freight Rail Capacity
Voting by Demographic Breakdown



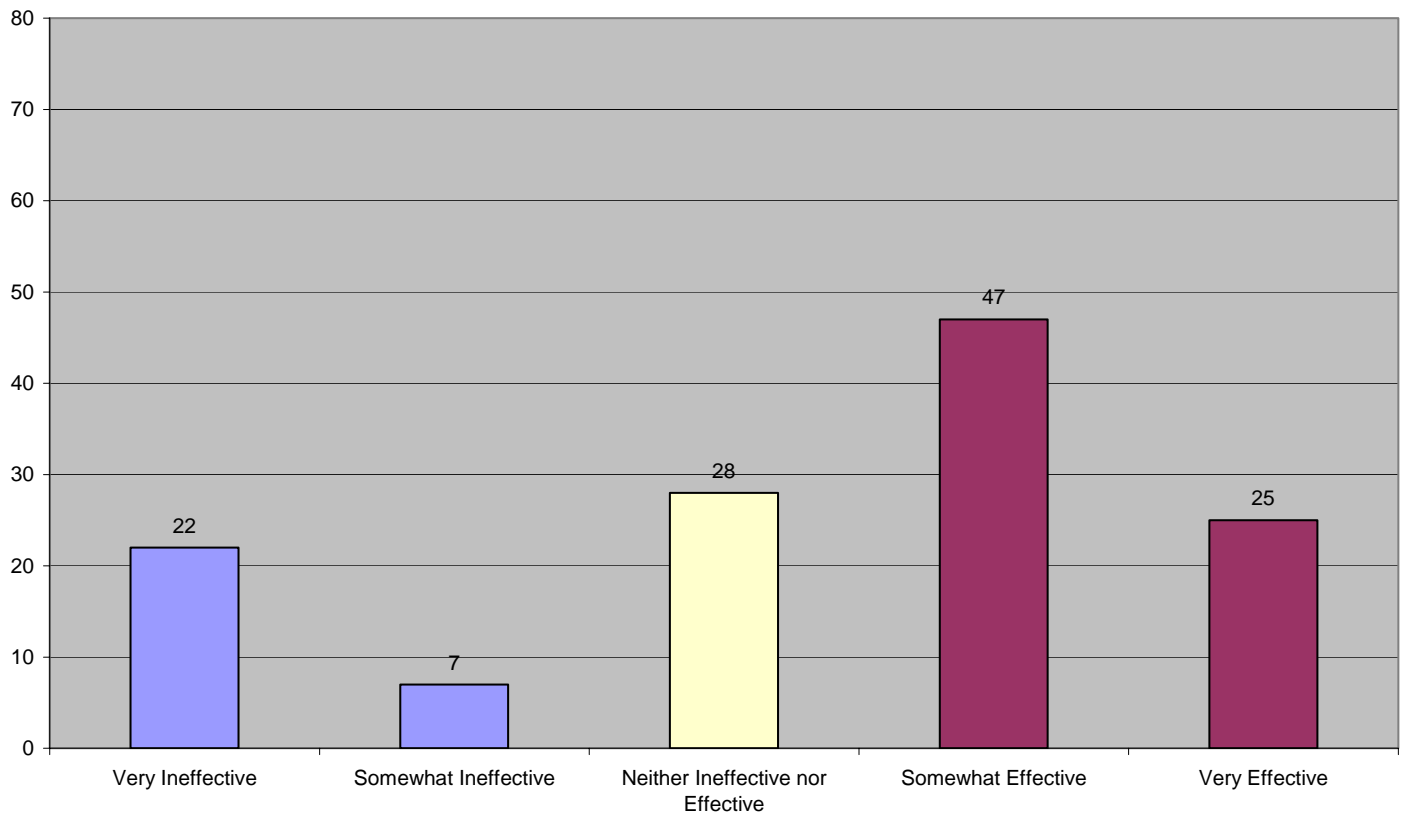
Solution Q: Develop Uniform Regional Contract Requirements
Total Votes



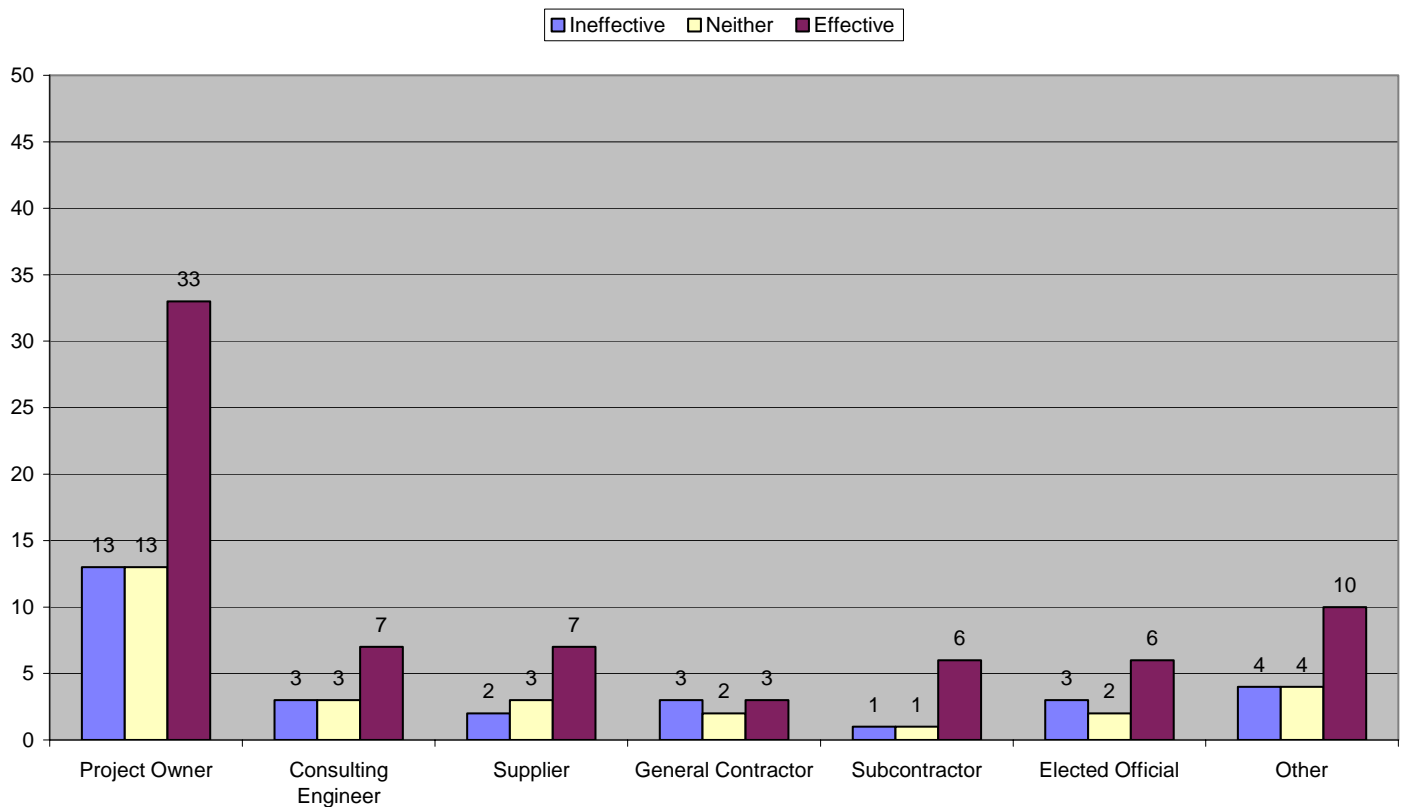
Solution Q: Develop Uniform Regional Contract Requirements
Voting by Demographic Breakdown



Solution R: Develop Variable Cost/Fee Scales to Adjust to Market Conditions
Total Votes



Solution R: Develop Variable Cost/Fee Scales to Adjust to Market Conditions
Voting by Demographic Breakdown



VOTING SUMMARY

Following is a summary list by ranking of the proposed solutions. Due to the way the lists are presented (by highest comparative vote totals) some solutions fall into multiple categories, and some solutions may fall into the top tier in both effective and ineffective categories. In those instances, it is important to note the number of votes in parentheses to determine how the solution fared overall. In addition, we did not include a separate listing for “Somewhat Effective” and “Somewhat Ineffective” categories, but used a combined ranking instead.

Very Effective

The solutions that rated highest (above 50 votes) for “Very Effective” included the following:

1. Solution O: Make Environmental Laws/Controls More User Friendly (77)
2. Solution M: Reduce Federal Review Process on Federally Funded Projects (70)
3. Solution Q: Develop Uniform Regional Contract Requirements (61)
4. Solution J: Reduce Tariffs on Mexican Imported Materials (58)
5. Solution N: Update Local and State Contract Provisions (56)
6. Solution B: Use Contractor in Design Process (54)
7. Solution L: Bring Key Stakeholders Together to Discuss Industry Issues (53)

Very/Somewhat Effective Ratings Combined

When adding together those voting “Very Effective” or “Somewhat Effective,” the top solutions (combined votes 90 or above) were:

1. Solution N: Update Local and State Contract Provisions (110)
2. Solution O: Make Environmental Laws/Controls More User Friendly (106)
3. Solution B: Use Contractor in Design Process (101)
4. Solution D: Reduce Construction Process Time by Concurrently Completing Tasks (98)
4. Solution M: Reduce Federal Review Process on Federally Funded Projects (98)
4. Solution Q: Develop Uniform Regional Contract Requirements (98)
5. Solution L: Bring Key Stakeholders Together to Discuss Industry Issues (94)
6. Solution J: Reduce Tariffs on Mexican Imported Materials (93)
7. Solution E: Owners Share in Supply Price Risk (90)

Neither Effective nor Ineffective

Votes falling most often into the neutral range (20 or above) included the following:

1. Solution K: Modify Bid and Appeal Process to Improve Productivity (40)
2. Solution I: Extend Alternative Bid Procurement to Subcontractors (39)
2. Solution G: Package Multiple Projects Together (39)
3. Solution A: Price Hedging (36)
4. Solution R: Develop Variable Cost/Fee Scales to Adjust to Market Conditions (28)
5. Solution P: Increase Freight Rail Capacity (25)
6. Solution C: Prepurchase Land and Materials (22)
7. Solution H: Index Materials (22)
8. Solution L: Bring Key Stakeholders Together to Discuss Industry Issues (22)
9. Solution F: Flexibility in Construction Contracts (20)

Very Ineffective

Few solutions scored high numbers of votes for “Very Ineffective” when compared to those voting in the effectiveness categories. The solutions ranking highest (10 votes or above) for “Very Ineffective” were:

1. Solution A: Price Hedging (31)
2. Solution I: Extend Alternative Bid Procurement to Subcontractors (23)
3. Solution R: Develop Variable Cost/Fee Scales to Adjust to Market Conditions (22)
4. Solution K: Modify Bid and Appeal Process to Improve Productivity (17)
5. Solution H: Index Materials (15)
6. Solution F: Flexibility in Construction Contracts (11)
6. Solution Q: Develop Uniform Regional Contract Requirements (11)
7. Solution C: Prepurchase Land and Materials (10)
7. Solution J: Reduce Tariffs on Mexican Imported Materials (10)
7. Solution P: Increase Freight Rail Capacity (10)

Very/Somewhat Ineffective Ratings Combined

When combining the votes in the “Very Ineffective” and “Somewhat Ineffective” categories, the rankings (20 and above) were:

1. Solution A: Price Hedging (47)
2. Solution I: Extend Alternative Bid Procurement to Subcontractors (35)
3. Solution H: Index Materials (30)
4. Solution R: Develop Variable Cost/Fee Scales to Adjust to Market Conditions (29)
5. Solution K: Modify Bid and Appeal Process to Improve Productivity (26)
6. Solution C: Prepurchase Land and Materials (22)
7. Solution F: Flexibility in Construction Contracts (21)
7. Solution G: Package Multiple Projects Together (21)
8. Solution E: Owners Share in Supply Price Risk (20)
8. Solution J: Reduce Tariffs on Mexican Imported Materials (20)